DRAFT



DETAILED PROJECT REPORT (DPR)

FOR REJUVENATION OF RAVI RIVER THROUGH FORESTRY INTERVENTIONS

VOLUME-II

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HIMACHAL PRADESH

1.1 Introduction

Himachal Pradesh is situated in the north-western part of India. It is surrounded by Jammu and Kashmir Union Territory in the north, Punjab and Haryana in the west, Uttar Pradesh in the south and Tibet in the east. It is the eighteenth largest State of India in respect of area and twenty first largest in population. It is one of the hilly states of India, and has many beautiful hill stations like Shimla, Kullu, Mandi, Chamba, Dalhousie, Manali and Dharamshala. It consists of many charming and attractive Valleys, lakes, mountains, tribal people, and has been considered to be the paradise for the trackers, climbers and campers. The State is often referred as the Devbhoomi (The Land of God) due to the numerous temples and pilgrimage centers located mostly along the rivers. Shimla is the capital of this State which was once the summer capital of the Britishers in India. The State is divided into 12 districts for administrative purpose. The drainage systems of the state are the Chenab, Ravi, Beas, Sutlej and Yamuna Rivers. These rivers are perennial, and are fed by glaciers/snow and rainfall.

1.2 State Profile

1.2.1 Geographical Extent

The state covers a geographical area of 55,673 km^2 which is about 1.69% of India's total area and extends between 30°22'40" N and 33°12'20” N Latitudes and 75°45'55" E and 79°04'20" E Longitudes. Physiographically, the State can be divided into four zones namely, Outer Himalaya or the Shivaliks, Inner Himalaya or Mid Himalaya and Greater Himalaya and Trans Himalaya. Himachal Pradesh largely comprises of hills and mountains ranging between 350 - 6,975 m amsl with gradual rise in the average elevation from south to north. Along the boundary of the State with the Indo-Ganga Plains (i.e., Punjab and Haryana), are low rolling hills with razor sharp ridges and towards north, there are higher mountain ranges and deep valleys (FSI, 2011).

The physiography of State is complex mosaic of hills, valleys and snow-clad peaks. The white snow covered mountain ranges towering over the plains of north India, are the most prominent physiographic features of the State. These are the Dhauladhar, Pir-Panjal and Great Himalaya Ranges, which are visible from a long distance. The steep mountain slopes are covered with coniferous and broad-leaved forests, meadows, pastures and terraces often clinging precariously to the mountain sides. The valleys lying amidst these mountain ranges contain gurgling streams torrents, terraced fields and fairy tale villages.

1.2.2 Geology, Topography and Soil

(A) Geology

The Himachal Pradesh is covered by the rocks ranging in age from Precambrian to Recent. The normal order of super-position of the rocks in the Lesser Himalaya has been affected by later events of thrusting owing to its complex tectonism and geological evolution. Geologically, rocks ranging from Proterozoic to Quaternary are exposed and represent classic geological sequence. Undifferentiated Proterozoic rocks are mostly confined to the Lesser Himalaya, and represented by Jutogh and Vaikrita Groups. Palaeo-Proterozoic represented by Jeori-Wangtu Banded Gneissic Complex and Kullu, Naraul, Sundernagar and Rampur Groups. Meso-Proterozoic in the Himachal Himalaya is represented by Larji and Shali Groups. The Larji Group consists of Lower Hurla Formation and Upper Aut Formation. The upper part of Meso-Proterozoic is represented by Darla-Tattapani (Peontra volcanics) represented by quartzite, slate and basic flows. The Neo-Proterozoic Era has been divided into two as lower and upper. The Lower Neo-Proterozoic Era is represented by Jaunsar, Shimla and Haimanta Groups whereas the Upper Neo-Proterozoic Era is represented by Guma, Blaini, Infrakrol, Krol, Manjir and Katarigali Formations. In the Spiti/Kinnaur and Higher Himalaya, the Cambrian rocks are represented by Kunzamla and Parahio Formations. The Permian in Himachal Pradesh is represented by Kuling Group in the Spiti/Kinnaur area and Chamba area, it is represented by Salooni formation. The Kuling Group is divisible into fossiliferous Gechang and Gungri Formations. These Groups consist of brown to grey, pale grey, coarse grained weakly bioturbated, cross bedded, calcareous sandstone with local conglomerate, black shale, calcareous silty shale, phosphatic, cherty and calcareous nodules and thin limestone. The Salooni Formation is represented by black shale, slate, calcareous slate and lenticles of limestone, and is fossiliferous (GSI, 2012).

(B) Topography

The topography is predominantly mountainous with exception of the areas bordering Punjab and Haryana plains, which have lower elevations. The altitude of the State varies from 350 - 6,975 m amsl. Himachal Pradesh lies on the southern slope of the Himalayan Range. The climate and vegetation vary greatly with elevation, from glaciers at the highest elevations to sub-tropical forests at the lower-elevations. Of the total geographical area, about 33% is under permanent snow cover/ glaciers, where it is not possible to grow trees due to physical limitations.

The lower hills comprising the district namely, Kangra, Hamirpur, Una, Bilaspur and lower parts of Mandi, Solan and Sirmour are known as Shivalik Hills. These are composed of highly unconsolidated deposits which easily lend themselves to erosion. They maintain almost a regular course from Ravi to Yamuna Rivers in the south of the region. Shivaliks have been highly deforested and eroded. The vegetation consists of tropical and sub-tropical forests. The altitude ranges from 350 - 1500 m amsl. This area is suitable for the cultivation of maize, wheat, ginger, sugarcane, paddy, table potatoes, guava, papaya, mango, lemon, kinnu, etc. The

Inner Himalaya or Middle Himalayan zone falls in upper areas or the tehsils of Peachhad and Renuka in Sirmour district, Chichot and Karsog tehsils of Mandi district; upper parts of Kangra and Palampur tehsils of Kangra district; upper Shimla Hills, and upper parts of Churah tehsil of Chamba district. The altitude ranges from 1,500 - 4,500 m amsl.

The major vegetation includes mixed deciduous forests, evergreen coniferous forests and mixed coniferous forests. This zone is useful for seed potatoes, temperate fruits, stone fruits and soft fruits. The Western Himalayan sub-alpine conifer forests, Western Himalayan alpine scrubs and alpine pastures form the main vegetation. The climate and soil are best suited for the cultivation of dry fruits. The Trans Himalaya includes the Himalayan ranges immediately north of the Great Himalayan Range. The Zaskar, the Ladakh, the Kailas and the Karakoram are the main Ranges. It stretches for a distance of about 1,000 km in east-west direction and average elevation is 3000 m amsl.

(C) Soil

The soils of Himachal Pradesh vary according to aspect, slope, altitude and climatic conditions. They may be classified in to three major groups as brown hill soils, podzolic or sub-montane soils and glacial and eternal snow types of soils. The major soil groups of the State can be further divided in to nine types. These are alluvial soils, brown hill soils, brown earth soils, brown forest soils, grey wooded or podzolic soils, grey brown podzolic soils, planosolic soils, humus and iron podzols, and alpine humus mountain skeletal soils. The brown hill soils are found in the Shivalik and Lesser Himalayan regions and cover 42.16% of the State's area. The middle and Greater Himalayan zones are characterized by podzolic or sub-montane type of soils covering nearly 46.07% of Himachal Pradesh. The glacial and eternal snow types of soils cover an area of 11.77%. These soils are not fully developed as they are found in the snow covered areas. The soils of Himachal Pradesh are mostly thin, but deep only in the valleys. The most of the soils are acidic in nature. The soils of Himachal Pradesh are under great stress and strain due to sheet and gully erosions. Large-scale deforestation and unscientific cultivation on the slopes have been mainly responsible for the large scale soil erosion. The total cultivated land of Himachal Pradesh is estimated to be 7.59 lakh ha, out of which nearly 43% is prone to very high and high intensity of erosion.

1.2.3 Climate

There is a great diversification in the climatic conditions of Himachal Pradesh due to variation in elevation and aspect. The state of Himachal Pradesh is a hilly region and it experiences a pleasant climate throughout the year. The climatic conditions vary from hot and sub-humid tropical (450 - 900 m amsl) in the southern low tracts, warm and temperate (900 – 1,800 m amsl), cool and temperate (1,900 – 2,400 m amsl), and cold alpine and glacial (2,400 – 4,800 m amsl) in high mountain ranges. The climate in Lahaul-Spiti and Kinnaur is of the arid to semi-arid type. The year is divided into three seasons i.e., winter (October to February), summer (March to June) and rainy (July to September). Snowfall usually occurs in the higher areas in December and January, though uncommon falls may be experienced earlier or later. At

elevations of about 3,000 m amsl, the average snowfall is about 3 m and lasts from December to March whereas, above 4,500 m elevation snow is perpetual.

The state normally has well defined rainy season. The monsoon sets in towards the end of June or early July. July and August are the rainiest months and considerable damage is caused by erosion, floods and landslides. Rainfall tapers off by the end of September. After September, it declines and continues to be so until April. Beyond Kullu towards Lahaul-Spiti and Kinnaur, rainfall decreases due to rain shadow effect. Spiti is the driest area (below 50 mm rainfall), being enclosed by high mountains on all sides. The highest amount of rainfall has been recorded in Dharmasala is 3,400 mm. The average annual rainfall is about 1800 mm. The average temperature in the summer months varies from 22^0 C to 37^0 C. throughout the State, temperature during winter months ranges from sub zero to 15^0 C.

1.2.4 River System and Hydrology

(A) River System

The drainage system of Himachal is composed both of rivers and glaciers. The present rivers are older than the mountain system. Himachal Pradesh provides water to both the Indus and Ganga River Basins. The drainage systems of the State are the Chandra Bhaga or the Chenab, Ravi, Beas, Sutlej and Yamuna. These rivers are perennial and are fed by glacier/snow and rainfall. They are protected by an extensive cover of natural vegetation. Total estimated Hydro-power Potential in Himachal Pradesh is 27,436 MW and power potential harnessed till date is 10,443 MW (DoE, 2019).

Ravi River

The Ravi River rises from Bara Bhangal a branch of Dhauladhar Range as a joint stream formed by glacier fed Bhadal and Tant Gari and flows about 158 km in Himachal Pradesh.

Tributaries: The description of the major tributaries is as follows.

Bhadal: It rises from the snowy range of the area lying between the Pir-Panjal and Dhauladhar Ranges in the Bara Bhangal area of the central Himachal Pradesh. It flows in a westerly direction before merging with the Tant Gari River to form the mainstream of the Ravi River. Bhadal River's catchment is made up of ‘U’- shaped Valleys, waterfalls, moraines, cirques and towering peaks.

Siul: It rises from the tract between the Dhauladhar and Pir-Panjal Ranges near Jammu and Kashmir UT and Himachal Pradesh border. Thereafter, this river flows towards east, takes a ‘U’ turn and attains a south-westerly course before flowing into the Ravi River downstream of Chamba. Baira River is the prominent tributary of the Siul River. This river is fed by both snow melt water and spring water.

Baira: It rises from the snows on southern slopes of the Pir-Panjal Range in Himachal Pradesh. Numerous tributaries of the Baira River are also fed by the snow and so make it a perennial

river before it joins the Siul River, which is a tributary of the Ravi River. Its catchment consists of steep slopes, deep valleys and terraces that have been laid down by the river since a long time.

Tant Gari: This River rises as a small stream from the slopes of an off shoot of the Pir-Panjal Range in the area east of Bharmaur in Chamba district. The Tant Gari valley is 'U'- shaped. Its bottom is strewn with boulders and morainic deposits lay down by the glaciers in the past. The physico-chemical parameters of water of Ravi River are given in Table 1.1.

Table 1.1 - Physico-Chemical Attributes of Ravi River Water During 2014

Sr. No.	Para-meters	Down Stream Chamera III	Down Stream Chamera II	Budhil *Nallah*	Chamba	Baira Dam	Surgani	Down Stream Chamera I
1	pH	8.4	8.00	8.15	7.64	8.45	8.60	8.72
2	D.O. (mg/l)	8.1	8.1	8.2	8.5	7.8	7.8	8.2
3	BOD (mg/l)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
4	Total Coliform (MPN/SPC/100 ml)	220	240	110	170	26	70	110

(Source: HPSPCB, 2014)

(B) Hydrology

Himachal Pradesh presents an intricate mosaic of mountain ranges, hills and valleys with varied altitudinal ranges. Himachal Pradesh forms a key and central part of the Indian Himalayan Region (IHR). The IHR covers vast areas, with about 17% of the region being under permanent snow cover and glaciers, and about 30-40% under seasonal snow cover, forming a unique water reservoir. This feeds important perennial rivers that provide water for drinking, irrigation, and hydropower. The total irrigation potential of Himachal Pradesh is 0.33 million ha (HIMCOSTE, 2013).

1.2.5 Water Resources Issues

Himachal Pradesh having the mountain ecosystems harbours a wide range of natural resources, and are particularly sensitive to change. Himalayan ecosystem is highly vulnerable due to geological reasons, stress caused by increased pressure of population, exploitation of natural resources, and other related challenges. These effects are likely to be exacerbated due to the impact of climate change, which may adversely impact the Himalayan ecosystem through

increased temperature, increased frequency of heavy precipitation, increase in extreme rainfall intensity, increased variability in rainfall patterns, increased likelihood of water shortages/drought, reduced levels of precipitation as snow, loss of glacier volumes, and earlier snow melt. This would not only impact the very sustenance of the indigenous communities in uplands, but also the life of downstream dwellers across the country and beyond. There is an urgent need for giving special attention to sustain the Himalayan ecosystem for maintaining ecological flow of the water. The sewage discharge in water bodies is also a source of concern.

1.2.6 Forests and Vegetation

The State has a geographical area of 55,673 km^2, out of which, 16,263 km^2 (29.21%) is under forests and tree cover. Out of the total forested area, 3,113 km^2 is under very dense forest cover, 7,126 km^2 under moderately dense forest cover, while 5,195 km^2 falls under open forests (FSI, 2019; Table 1.2 and Table 1.3). The growing stock in recorded forest area and Trees Outside Forests (TOFs) are 347.07 and 25.19 million m^3, respectively.

Table 1.2 - Forests and Tree Cover in Himachal Pradesh

Very Dense Forests (km^2)	Moderately Dense Forests (km^2)	Open Forests (km^2)	Total Forests (km^2)	Tree Cover (km^2)	Total Forests and Tree Cover (km^2)
3,113	7,126	5,195	15,434	829	16,263

(Source: FSI, 2019)

Table 1.3 - Recorded Forest Area in Himachal Pradesh

Reserved Forests (km^2)	Protected Forests (km^2)	Unclassed Forests (km^2)	Total (km^2)
1,898	33,130	2,005	37,033

(Source: FSI, 2019)

The vegetation of the State is broadly grouped under following categories based largely on the altitude Ranges and species composition (Table 1.4)

Table 1.4 - Forest Types of Himachal Pradesh

Group	Forest types	Altitude (m)	Dominant Species
1.Tropical Moist Deciduous Forests	1. Bhabar-Dun Sal Forests	< 650 m	*Shorea robusta, Lagerstroemia parviflora, Mallotus philippensis, Cassia fistula and Senegalia catechu*
2. Tropical Dry Deciduous	1. Northern Dry Mixed Deciduous Forests	< 750 m	*Anogeissus latifolia, Senegalia catechu and Diospyros montana*

Forests	2. Dry Deciduous Scrubs	< 750 m	*Senegalia catechu, Butea monosperma, Lannea coromandelica, Nyctanthes arbor-tristis, Dodonaea viscosa* and *Woodfordia fruticosa*
	3.Euphorbia Scrubs	< 750 m	*Euphorbia* spp. and *Acacia* spp.
	4. Khair-Sissu Forests	< 750 m	*Dalbergia sissoo* and *Senegalia catechu*
	5. Dry Bamboo Brake	< 750 m	*Dendrocalamus strictus*
3. Sub-tropical Pine Forests	1. Lower or Shivalik Chir Pine Forests	800-1,700 m	*Pinus roxburghii*
	2. Upper or Himalayan Chir Pine Forests	1,200-1,700 m	*Pinus roxburghii, Quercus oblongata* and *Rhododendron arboreum*
	3. Himalayan Sub-tropical Scrubs	< 1,000 m	*Carissa opaca, Dodonaea viscosa* and *Rhus parviflora*
4. Himalayan Moist Temperate Forests	1.Ban Oak Forests	1,600-2,300 m	*Quercus oblongata, Rhododendron arboreum* and *Lyoia ovalifolia*
	2. Moru Oak Forests	1,200-2,250 m	*Quercus floribunda, Quercus oblongata, Pinus wallichiana, Cedrus deodara* and *Rhododendron arboreum*
	3. Oak Scrubs	1,200-2,200 m	*Berberis* spp., *Pyracantha crenulata, Rosa* spp., *Prinsepia utilis* and *Zanthoxylum armatum*
	4. Moist Deodar Forests	1,700-3,500 m	*Cedrus deodara, Pinus wallichiana, Picea smithiana* and *Abies pindrow*
	5. Western Mixed Coniferous Forests	2,100-3,000 m	*Picea smithiana, Abies pindrow, Pinus wallichiana, Cedrus deodara* and *Quercus* spp.
	6. Moist Temperate Deciduous Forests	1,800-2,750 m	*Acer caesium, A. pictum, Betula alnoides, Ulmus wallichiana* and *Abies pindrow*
	7. Low-Level Blue Pine Forests	1,800-2,750 m	*Pinus wallichiana*
	8. Oak Scrubs	1,200-2,750 m	*Rosa moschata, Pyracantha crenulata, Rhus parviflora, Rubus ellipticus, Berberis* spp., *Desmodium elegans, Quercus oblongata* and *Indigofera heterantha*
	9. Himalayan Temperate Secondary Scrubs	1,200-2,750 m	*Plectranthus rugosus, Berberis asiatica, Berberis lycium, Caryopteris* spp., *Myrisine africana, Rosa moschata* and *Zanthoxylum armatum*

	10. Kharsu Oak Forests	2,600-3,500 m	*Quercus semecarpifolia, Picea smithiana, Pinus wallichiana, Rhododendron arboreum, Ilex dipyrena, Prunus cornuta, Betula utilis* and *Acer accuminatum*
	11. West Himalayan Upper Oak/Fir Forests	2,600-3,000 m	*Abies pindrow, Pinus wallichiana, Quercus semecarpifolia, Taxus wallichiana, Betula utilis* and *Acer* spp.
	12. Montane Bamboo Brakes	> 2,400 m	*Drepanostachyum falcatum, Thamnocalamus spathiflorus, Quercus* spp. and *Rhododendron* spp.
	13. Cypress Forests	1,800-2,800 m	*Cupressus torulosa, Cedrus deodara, Quercus floribunda* and *Pyrus pashia*
	14. Alder Forests	1,000-3,000 m	*Alnus nitida, Populus ciliata, Celtis australis* and *Ulmus wallichiana*
5. Himalayan Dry Temperate Forests	1. Dry Broadleaved and Coniferous Forests	2,000-2,400 m	*Pinus gerardiana, Cedrus deodara* and *Quercus ilex*
	2. Neoza Pine Forests	1,700-3,000 m	*Pinus gerardiana* and *Cedrus deodara*
	3. Dry Deodar Forests	2,100-3,250 m	*Cedrus deodara, Pinus wallichiana and Picea smithiana*
	4. West Himalayan Dry Temperate Deciduous Forests	2,900-3,600 m	*Acer caesium, A. pictum, Betula alnoides* and *Ulmus wallichiana*
	5. West Himalayan High- Level Dry Blue Pine Forests	3,000-3,600 m	*Pinus wallichiana, Pinus gerardiana* and *Abies pindrow*
	6. West Himalayan Dry Juniper Forests	2,500-4,300 m	*Juniperus polycarpos, Fraxinus xanthoxyloides* and *Rosa* spp.
	7. Populus/Salix Forests	3,000-4,000 m	*Populus euphratica and Salix* spp.
	8. Western high-Level Dry Blue Pine Forests	3,000-3,600 m	*Pinus wallichana, Pinus gerardiana, Abies spectabilis, Betula utilis, Rhododendron campanulatum, Juniperus indica* and *Juniperus wallichiana*
6. Sub Alpine Forests	1. West Himalayan Sub-Alpine Fir Forests	2,900-3,050 m	*Abies pindrow, Pinus wallichiana* and *Picea smithiana*
	2. West Himalayan Sub-Alpine Birch/Fir Forests	2,900-3,050 m	*Abies pindrow, Betula utilis, Rhododenron* spp. and *Quercus semecarpifolia*
7. Moist Alpine Scrubs	3.Birch/Rhododendron Scrub Forests	>3,500 m	*Rhododendron* spp.
	4. Deciduous Alpine Scrubs	>3,350 m	*Betula utilis, Syringa emodi, Salix* spp., *Lonicera* spp. and *Berberis* spp.

	5. Dwarf Rhododendron Scrubs	3,350-4,600 m	*Rhododendron* spp.
8. Dry Alpine Scrubs	1.Dry Alpine Scrubs	2,800-4,300 m	*Hippophae* spp., *Juniperus wallichiana* and *Juniperus indica*
	2. Dwarf Juniper Scrubs	2,900-4,200 m	*Juniperus wallichiana* and *Juniperus indica*

(Source: FSI, 2011).

1.2.7 Agro-ecosystem

Agriculture is one of the most significant sectors of the economy of Himachal Pradesh. Important crops grown in the state are maize, wheat, rice, barley, pulses, oilseed, buckwheat, minor millets, potato, ginger, tea, peas, kuth, hops and a variety of vegetables. The fruit, particularly pome, stone and dry fruits like chilgoza, walnut, pecan nut and pistachio are widely grown and the region is important for large scale processing industry. Although, the State is deficient in food grains production, it has gained importance in the production of vegetables and fruits such as seed potato, vegetables, ginger, chicory seeds, hops, olives, figs, apples and mushrooms, besides certain medicinal and aromatic plants. Land use pattern of Himachal Pradesh during 2013-14 is given in Table 1.5.

Table 1.5 - Land Use Pattern in Himachal Pradesh

Sr. No.	Land use	Area in '000 ha	Percentage (%)
1	Total Geographical Area	5,567	NA
2	Reporting Area for Land Utilisation	4,576	100.00
3	Forests	1,126	24.61
4	Not Available for Cultivation	1,127	24.64
5	Permanent Pastures and Other Grazing Lands	1,511	33.01
6	Land under Miscellaneous Tree Crops and Groves	64	1.39
7	Culturable Wasteland	122	2.66
8	Fallow Lands other than Current Fallows	22	0.49
9	Current Fallows	54	1.18
10	Net Area Sown	550	12.02

(Source: FSI, 2017)

Agriculture being main occupation of the people of Himachal Pradesh has an important role in the economy of the State. It provides direct employment to about 62% of the main working population. Income from the agriculture and allied sectors accounts for nearly 9.40% of the State domestic products. Out of the total geographical area of 55,673 km^2, area of operational holding is about 9.560 km^2 owned by 9.61 lakh farmers (DoA, 2019). The average holding size is about 1.0 ha (Table 1.6).

Table 1.6 - Distribution of Operational Land Holdings in Himachal Pradesh

Sr. No.	Land Holding Class	No. of Land Holdings (lakh)	Area (lakh ha)	Average size of Holding (ha)
1	Marginal (<1.0 ha)	6.70	2.73	0.41
2	Small (1.0- <2.0 ha)	1.75	2.44	1.39
3	Semi Medium (2.0-<4.0 ha)	0.85	2.31	2.72
4	Medium (4 <10 ha)	0.28	1.57	5.61
5	Large (≥10 ha)	0.03	0.51	17.00
Total		**9.61**	**9.55**	**1.00**

(Source: DoA, 2019)

Rearing of livestock is integral to the rural economy of Himachal Pradesh. Cattle, goats and sheep are reared mostly by every family in the rural areas. These animals graze in open areas i.e., fallows, wastelands, pastures, community lands, forestlands, etc. After crop harvest, these animals are also allowed into the agricultural fields for the grazing. The productivity of these animals is low. The collection of grass and leaf fodder is an essential part of daily chores for the people, especially women. Grazing animals pose the greatest challenge to forest regeneration and plantation establishment in the hills.

1.2.8 Biodiversity

The great diversity in the biological resources of the Himachal Pradesh is due to its varied topography, geological formations, altitudinal ranges, and climatic conditions. The State has aesthetic, commercial, cultural and genetic values because of different floral and faunal biodiversity. The biodiversity elements in the State vary from temperate, tropical, sub-tropical, sub-alpine and alpine types. The State has 95% of the floral and faunal species endemic and 5% of the other species are of exotic nature.

The State has reported 3,256 species out of the total 47,000 plant species found in the country. Himachal Pradesh has 3120 species of Angiosperms, 13 species of Gymnosperms, 124 Pteridophytes and 13 species of Orchids. It has diverse and unique flora and fauna. Out of 89,451 species of animals in India, the State harbors 5,721 species of the Indian fauna which shows richness of biological resources of the State considering its small geographical area. The faunal diversity includes 666 Chordates (77 Mammals, 447 Birds, 44 Reptiles, 17 Amphibians and 81 Fishes), 4543 Arthropods (2 Bryozoa, 4362 Insects, 195 Arachnids, 11 Myriopods and 73 Crustaceans) and 412 others (60 Annelids, 73 Molluscs, 2 Acanthocephala, 132 Nematodes, 16 Rotifers, 90 Platyhelminthes, 2 Cnidaria, 3 Porifera and 34 Protozoans). The Western Tragopan, a rare and endangered species, is confined only to the North Western Himalaya. Himachal Pradesh also has probably the largest population of Chir Pheasant in the world (HIMCOSTE, 2005).

The Great Himalayan National Park was awarded UNESCO World Heritage Site status in 2014, in recognition of its outstanding significance for biodiversity conservation. The Park protects over 1,000 plant species representing 128 families and 427 genera, including many medicinal herbs, 31 mammals and 209 bird, as well as amphibians, reptiles and insects. There are 5 National Parks, 26 Wildlife Sanctuaries, 3 Conservation Reserves and 1 Biosphere Reserve covering 8391 km^2 and 15.11% of geographical area of Himachal Pradesh (HPFD website).

1.2.9 Demography

According to the 2011 Census of India, Himachal Pradesh has a population of 68,64,602 comprising 34,81,873 male and 33,82,729 female, with 10.03 % of the population living in urban regions. There are 20,118 villages, 3,037 Gram Panchayats, 57 towns, 28 Nagar Panchayats and 21 Nagar Parishads including Municipal Corporations. Lahaul and Spiti is the largest and Hamirpur is the smallest district of the state with geographical area of 12,835 km^2 and 1,118 km^2, respectively. The rural and urban populations in the State is 61,76,050 and 6,00,552 persons, respectively. The density of population in the state varies from as low as 2 persons km^2 in Lahaul and Spiti district to 406 persons km^2 in Hamirpur district as compared to the State average of 128 persons km^2. Shimla is the largest Town with a population of 1,42,161 and Narkanda is the smallest one with a population of 712.

There are two thousands or more temples all over the State. The State has a number of tourist destinations and places of pilgrimage e.g., Manali, Kullu, Manikaran, Shimla, Dharamshala, Kasauli, Malana, Shimla, Dalhousie, Kaza, Tabo, Kasol, Khajjiar, Kufri, Chail, Solang Valley, Chamba, Kangra, Brajeshwari Temple, Jwalamukhi Temple, Chamunda Devi Temple, Chintpurni Temple, Rewalsar, Shikari Devi, Bijli Mahadev Temple, Bhimakali Temple, Hatkoti, Jakhu, Naina Devi Temple, Kamrunag, Prashar, Renuka, Chandertal, Surajtal, Baba Balak Nath Temple, Manimahesh, etc.

As per data compiled by the Tourism Department, as many as 19.6 million tourists, including 0.47 million foreigners visited the State during 2017-2018. These figures, which are nearly 2.8 times of the whole population of the state itself, reflect a high 'tourist load' on urban infrastructure and urban services. The major sources of pollution of the rivers are generally the discharges of untreated and partially treated wastewater from the human habitations.

1.3 Riverscape Analysis

1.3.1 Methodology

Landsat 8 satellite data for the month of November and December 2018 has been used for preparation of Land Use and Land Cover map of the riverscape. The Row, Path along with Date of Pass of the satellite data used in the current study for the parts of Himachal Pradesh covering the riverscape is given in Table 1.7 and Fig.1.1.

Table 1.7 - List of data downloaded and used in the study

State	Path	Row	Date of Pass	Satellite
Himachal Pradesh	147	037	10-Nov-2018	Landsat-08
Himachal Pradesh	147	038	10-Nov-2018	Landsat-08
Himachal Pradesh	148	037	03-Dec-2018	Landsat-08
Himachal Pradesh	148	038	17-Nov-2018	Landsat-08

1.3.2. Riverscape Profile

(A) Spatial Extent

The Ravi Riverscape with in Himachal Pradesh, lies between 32˚08'47.91" to 33˚01' 0.97" N Latitudes and 75˚ 50'09.55" to 77˚ 3'07.35" E Longitudes and occupies a geographical area of 5,041.00 km^2 which constitute 54.95% of total riverscape area. The project area falls in Kangra and Chamba district of Himachal Pradesh. Very small area of Kangra district forms the upper reaches of Ravi River basin where Ravi River originates while Chamba district forms the lower part of the basin in Himachal Pradesh. The river has a total length of about 158 km in Himachal Pradesh and its major tributaries are Budhil, Siul, Baira, Tant Gari, Saho, Chirchind *Nallah* and Bhadal River. The well-known human settlements along the river are Bharmaur, Madhopur and Chamba town.

Details of the riverscape under consideration from the point of view of DPR are shown in Fig.1.1 and spatial extents state-wise are presented in Table 1.8. The catchment, sub-catchment, watershed, sub-watershed and micro-watersheds of Ravi River are given in Fig. 1.2 to 1.6.

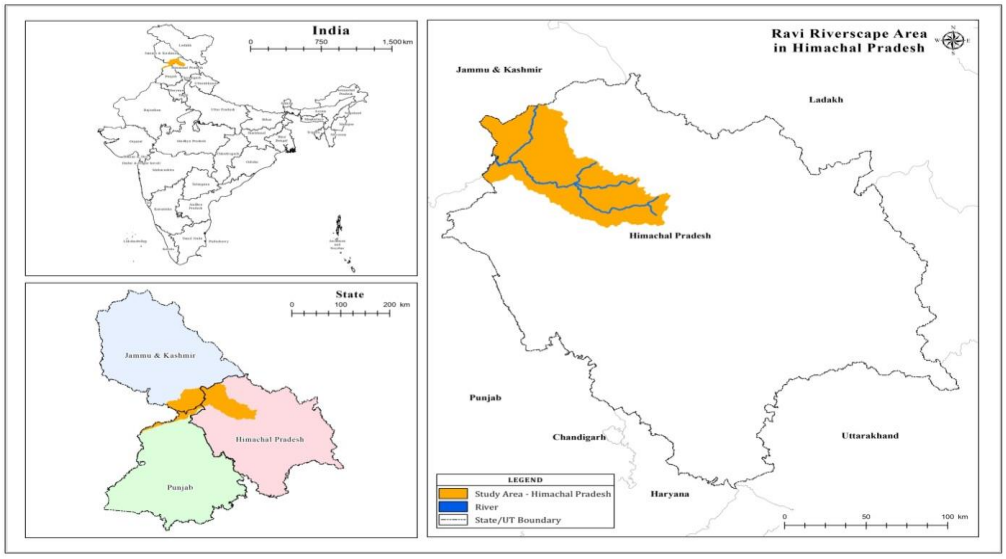


Fig. 1.1 - Ravi Riverscape Area in Himachal Pradesh

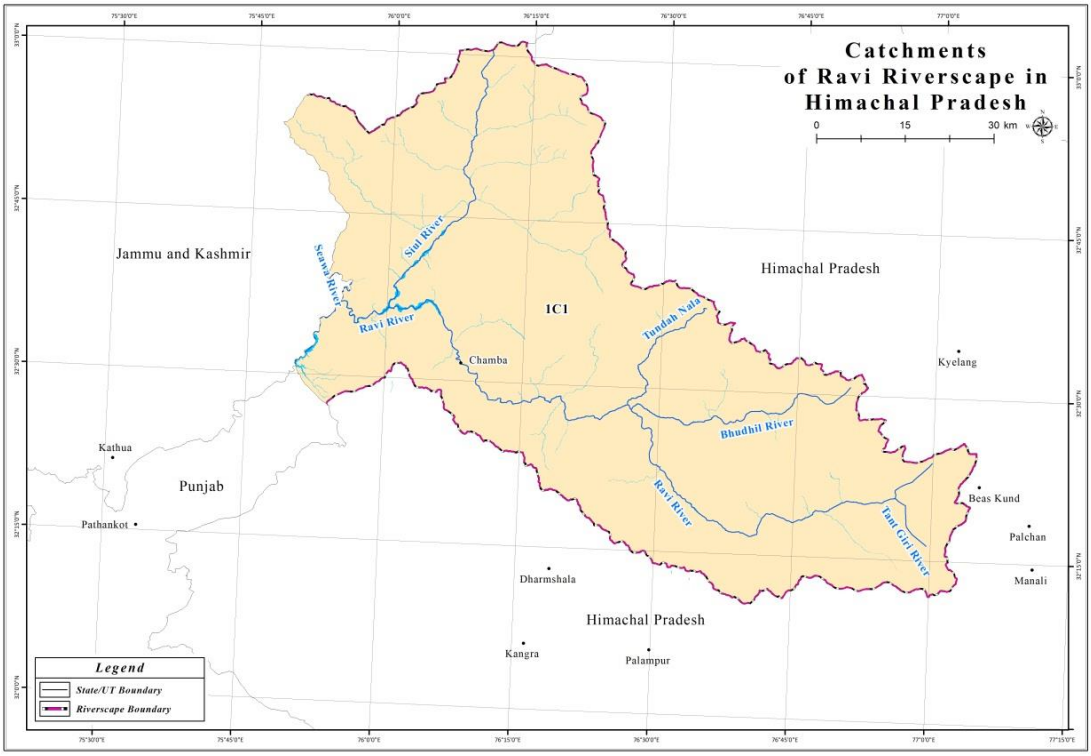


Fig. 1.2 - Catchment Area of Ravi Riverscape in Himachal Pradesh

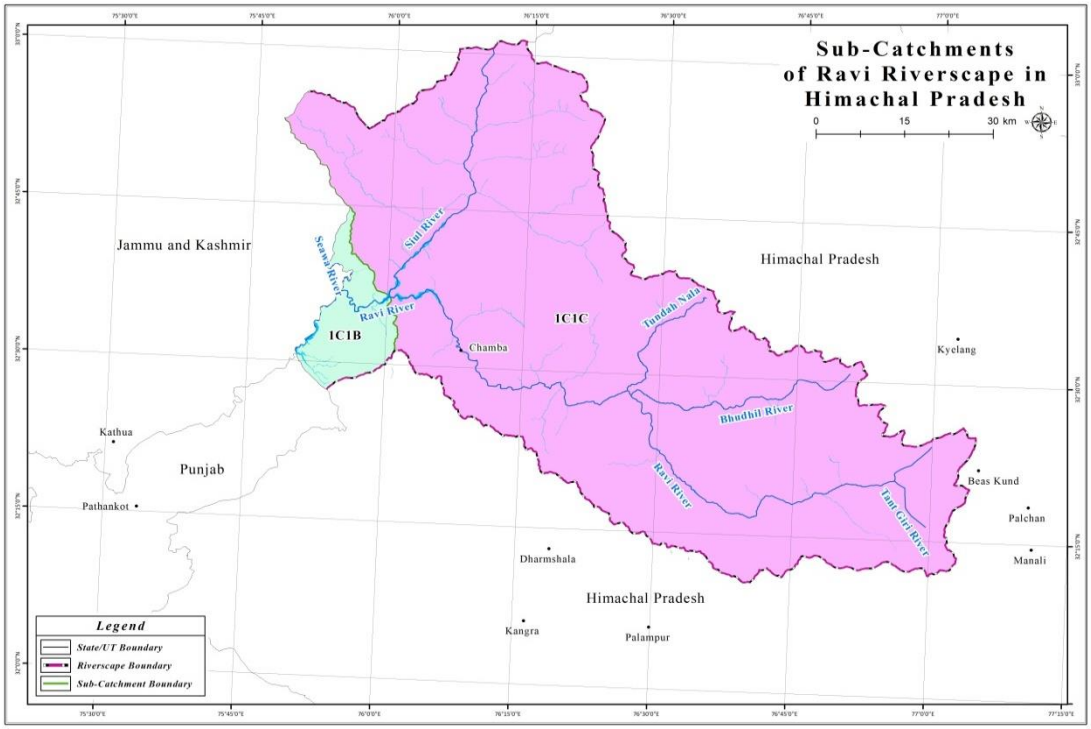


Fig. 1.3 - Sub-Catchment of Ravi Riverscape in Himachal Pradesh



Fig. 1.4 - Watersheds of Ravi Riverscape in Himachal Pradesh

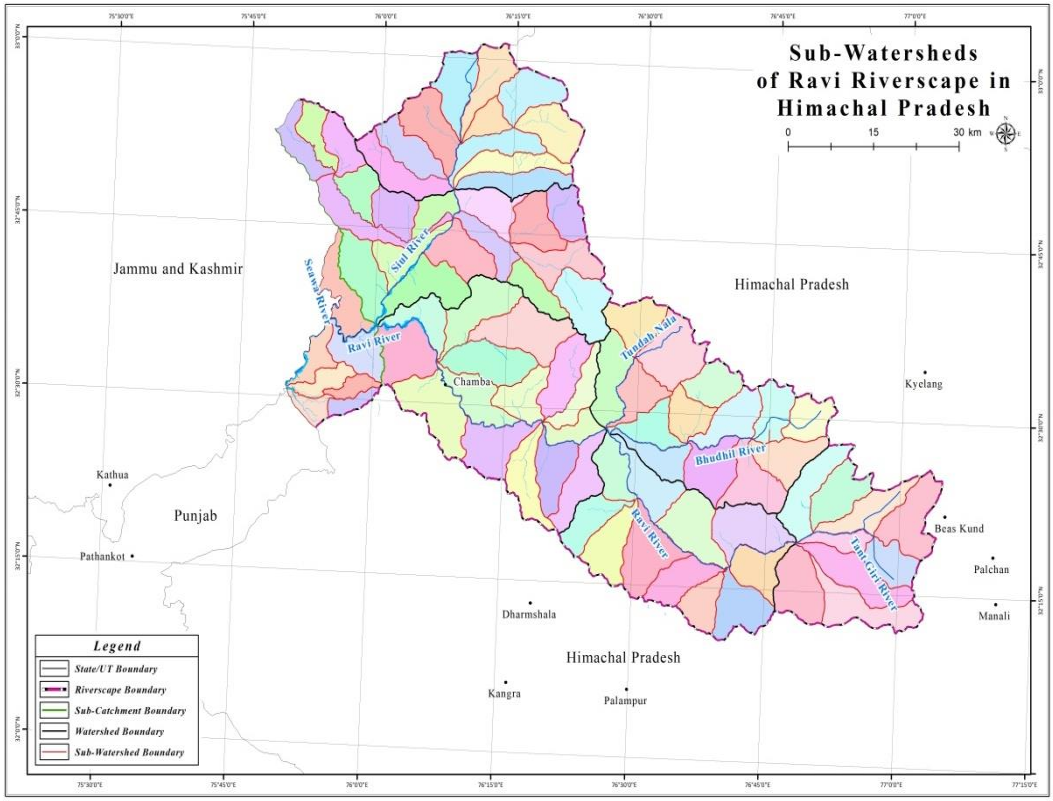


Fig. 1.5 - Sub-Watersheds of Ravi Riverscape in Himachal Pradesh

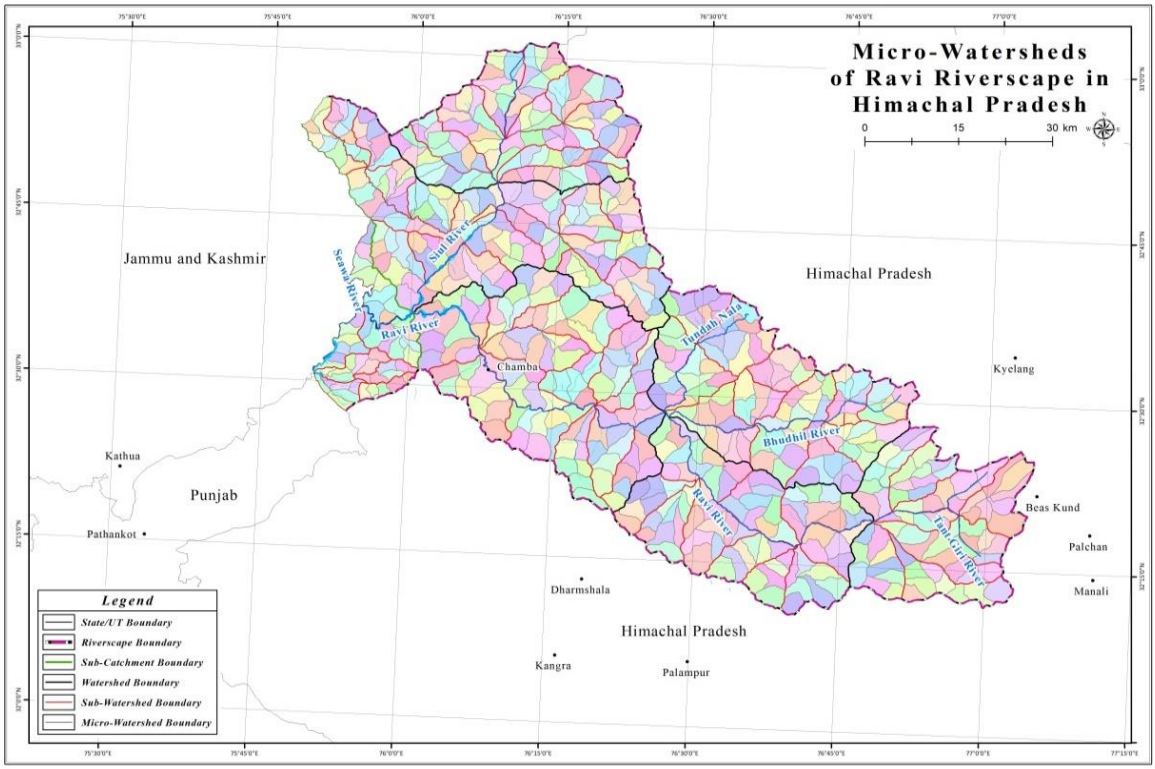


Fig. 1.6 - Micro-Watersheds of Ravi Riverscape in Himachal Pradesh

Table 1.8 - Spatial Extent of the Project Area in the Himachal Pradesh

Sr. No.	State/UT	Geographical Area of State (km^2)	Catchment Area	Representative Area included in Riverscape (km^2)	Geographical Coordinates		Representative Area of Riverscape (%)
					N (Lat.)	E (Long.)	
1	**Himachal Pradesh**	55,673	5,041.00	5,041.00	32˚10'31"N to 33˚01'25"N	75˚ 47'51"E to 77˚ 4'44"E	54.95

(B) Land Use and Land Cover

A total of 14 major land use and land cover types i.e., Dense Forests, Moderately Dense Forests, Open Forests, Alpine Pasture, Scrubs, Barren, Settlement, Agriculture, Plantation, Water body, Canal, River(Perennial), River (Dry)/River sand and Snow/Glaciers have been delineated and mapped in the riverscape. The distribution of area under different land cover and land use classes is given in Table 1.9 and Fig. 1.7.

Table 1.9 - Distribution of Area under Different Land Cover and Land Use Classes in the Ravi Riverscape

Sr. No.	LAND USE AND LAND COVER	AREA (km^2)
1	Dense Forests	794.75
2	Moderately dense forests	511.48
3	Open forests	394.49
4	Alpine pasture	0.83
5	Scrubs	196.30
6	Barren	870.15
7	Settlements	10.05
8	Agriculture	397.62
9	Plantation	8.58
10	River perennial	31.49
11	River dry / River sand	17.04
12	Snow / glacier	1671.78
13	Cloud	135.63
14	Cloud shadow	0.81
TOTAL		**5041.00**

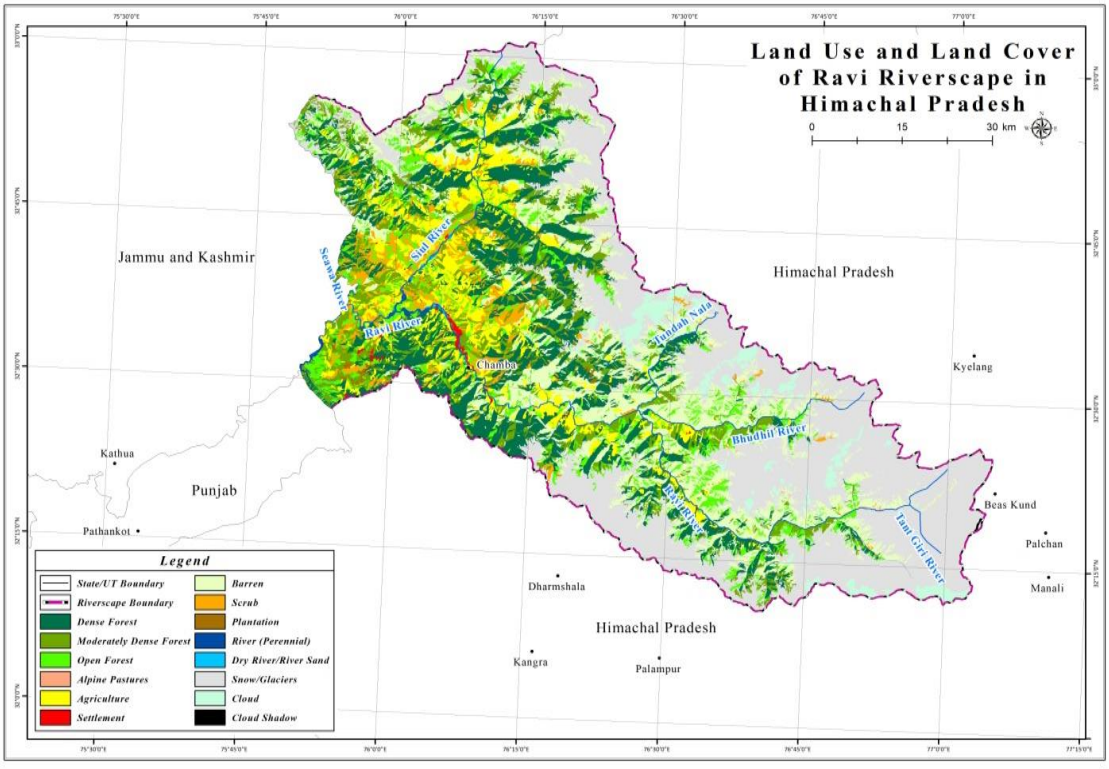


Fig. 1.7 – Land use and Land Cover of Ravi River in Himachal Pradesh

(C) Elevation

The area in the riverscape within Himachal Pradesh was grouped into 11 categories/classes. The distribution of areas under different elevation classes is given in Table 1.10 and Fig. 1.8.

Table 1.10 - Distribution of Areas under Different Elevation Classes in Himachal Pradesh

Sr. No.	ELEVATION CLASSES	AREA (km^2)
1	250 m to <500 m	6.22
2	500 m to <750 m	58.89
3	750 m to <1000 m	108.16
4	1000 m to <1250 m	164.26
5	1250 m to <1500 m	234.51
6	1500 m to <2000 m	286.65
7	2000 m to <2500 m	326.69
8	2500 m to <3000 m	1457.40
9	3000 m to <4000 m	1297.71
10	4000 m to <5000 m	1002.53
11	≥5000 m	97.98
TOTAL		**5041.00**

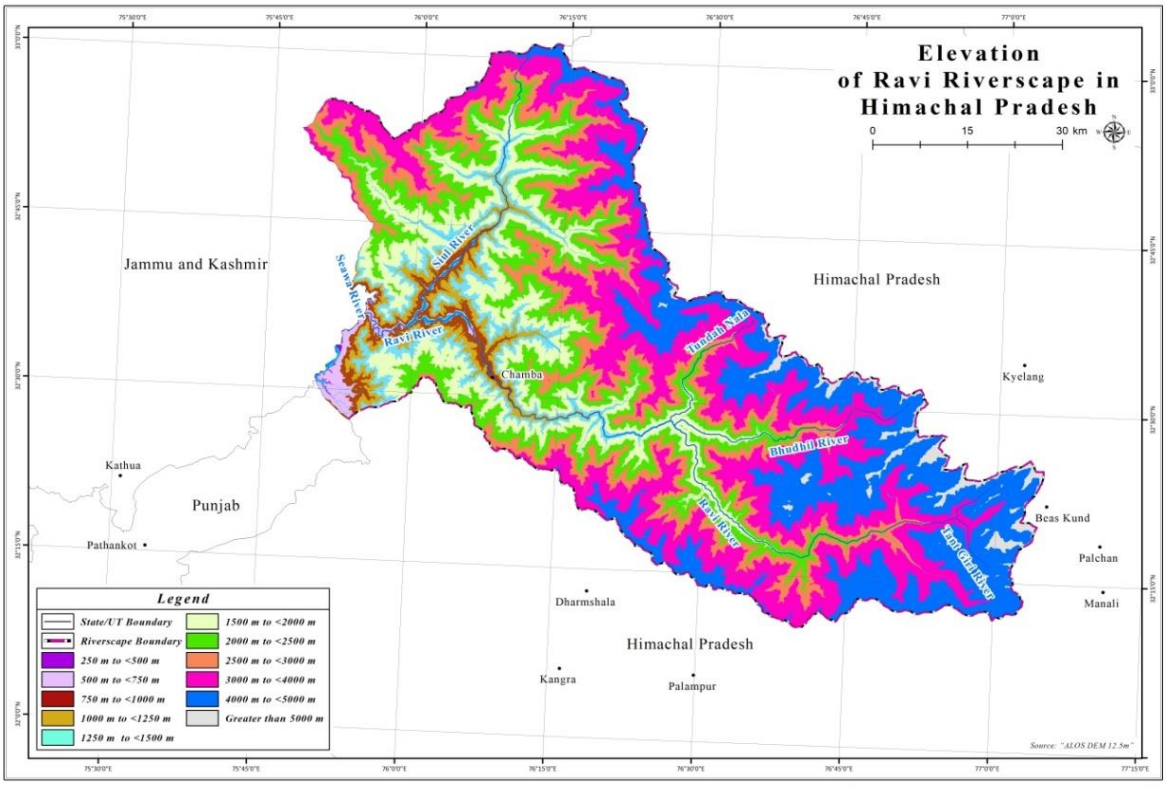


Fig. 1.8 - Elevation of Ravi Riverscape in Himachal Pradesh

(D) Slope

Slope information is considered vital while suggesting suitability of areas for forestry interventions, particularly plantations. The higher degree of slopes (>30°) usually cause a lot of soil erosion and are prone to landslides, greater runoff, etc. Thus, areas with slopes

>30° to 45° require safeguards from erosion while raising plantations of multiple values i.e., fuel wood, fodder, small timber, etc. A total of 10 classes of slope have been derived in the riverscape in Himachal Pradesh. The distribution of areas under different slope classes is given in Table. 1.11 and Fig. 1.9.

Table 1.11 - Distribution of Area under Different Slope Categories in Himachal Pradesh

Sr. No.	SLOPE	AREA (km^2)
1	<2.5	13.6
2	2.5 to <5	31.78
3	5 to <10	124.57
4	10 to <15	191.67
5	15to<20	317.70
6	20 to <25	483.45
7	25 to <30	764.72
8	30 to <35	921.13
9	35 to <40	896.62
10	≥40m	1295.76
TOTAL		**5041.00**

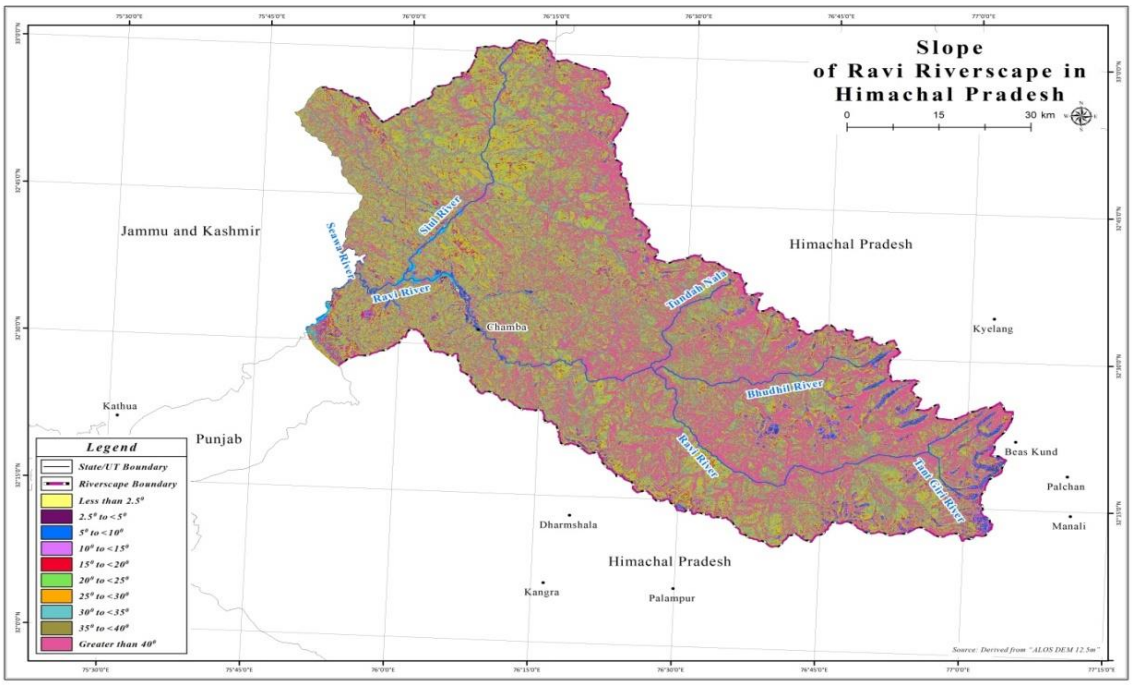


Fig. 1.9 - Slope of Ravi Riverescape in Himachal Pradesh

(E) Aspect

Aspect, particularly in the Himalayas, influences the diversity and distribution of vegetation and microclimate. North and south facing opposing slopes vary in their microclimate; light intensity, soil and air temperature, humidity, soil moisture and evaporation and duration of growing periods and these differences are closely associated with differences in vegetation composition and structure. The aspect map has been derived from the ALOS DEM. A total of

nine categories viz., North, North-East, East, South-East, South, South-West, West, North-West and the Flat land has been analyzed in the study area in Himachal Pradesh. The distribution of areas under different aspect classes is given in Table 1.12 and Fig. 1.10.

Table 1.12 - Distribution of Percentage of Total Area in Different Aspect Categories in Himachal Pradesh

Sr. No.	ASPECT	AREA(km^2)
1	Flat (-1)	1.80
2	North (0-22.5,337.5-360)	646.71
3	Northeast (22.65-67.5)	582.22
4	East (67.5-112.5)	547.73
5	Southeast (112.5-157.5)	621.69
6	South (157.5-202.5)	660.32
7	Southwest (202.5-247.5)	693.37
8	West (247.5-292.5)	638.46
9	Northwest (292.5-337.5)	648.7
TOTAL		**5041.00**

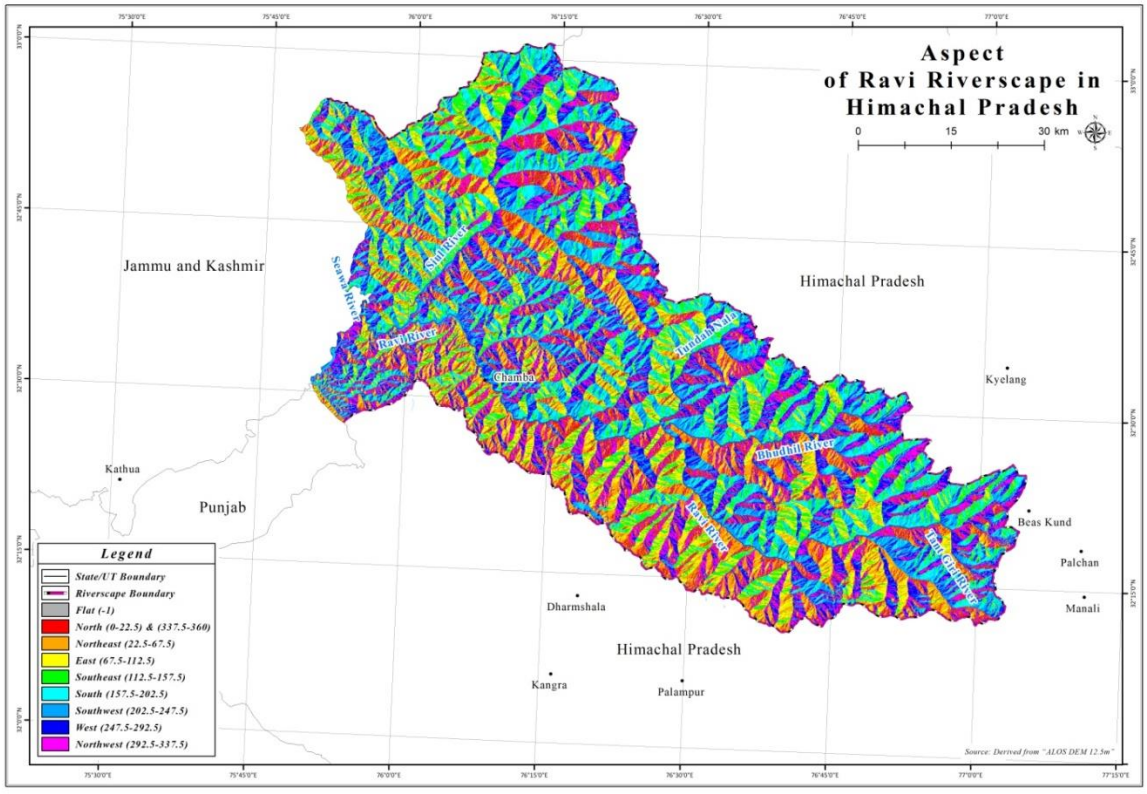


Fig. 1.10 - Aspect of Ravi Riverscape in Himachal Pradesh

(F) Soil Types

Soil is considered as one of the most important parameter for modelling suitability of forests plantation zones. Since choice of species mainly depend upon the soil type and soil depth these parameters have been derived from Soil map prepared by NBSS-LUP for further use in modelling in the present study. A total of 10 soil type classes have been recorded in the riverscape in Himachal Pradesh. Various soil types and their proportionate area estimates are given in Table 1.13 and Fig. 1.11. The soil type – Dystic Eutrochrepts was the most dominant soil type in the Ravi Riverscape in Himachal Pradesh. This was followed by Typic Udorthents.

Table 1.13 - Distribution of Area under Different Soil Types and Other Land Attributes in Himachal Pradesh

Sr. No.	SOIL TYPE	AREA (km^2)
1	Dystric Eutrochrepts	1654.98
2	Lithic udorthents	1167.75
3	Typic eutrochrepts	46.52
4	Typic udorthents	1409.43
5	Typic cryorthents	620.49
6	Lithic cryorthents	138.20
7	Dystric Fluventic Eutrochrets	3.63
TOTAL		**5041.00**

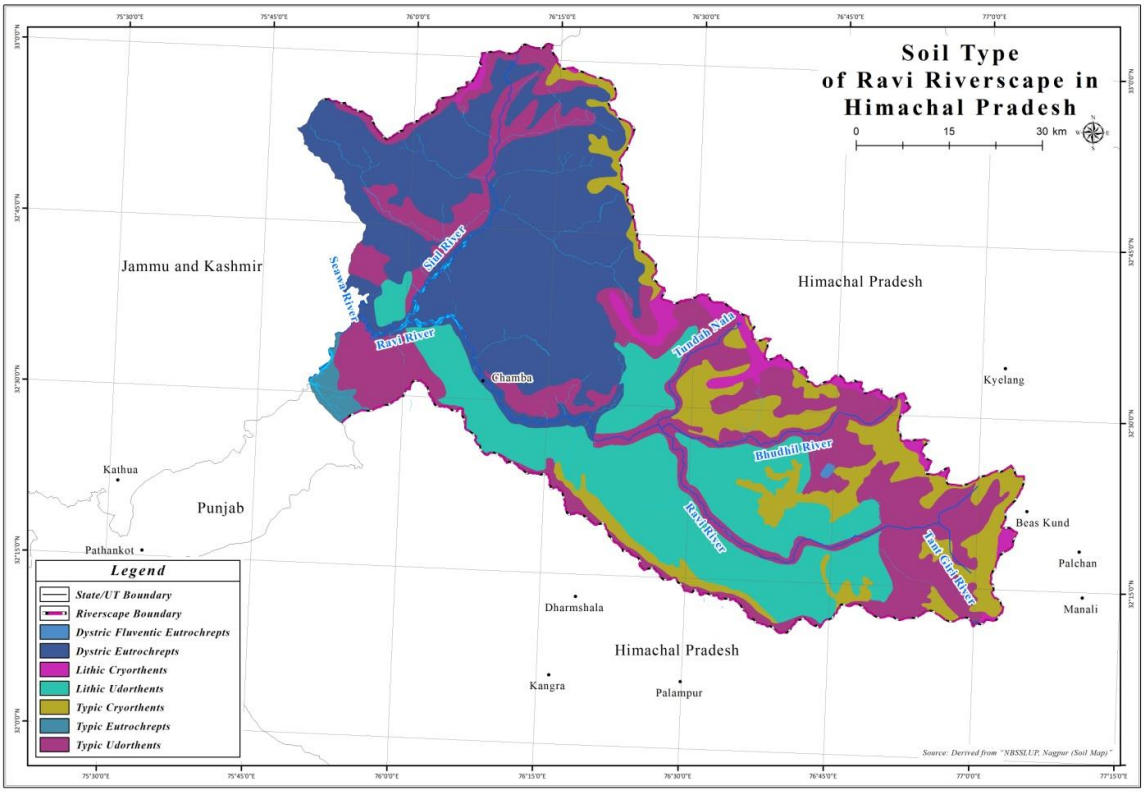


Fig. 1.11 - Soil Type of Ravi River in Himachal Pradesh

(G) Soil Depth

Soil depth can greatly influence the type of plants that can grow in them. Deeper soils generally provide more water and nutrients to plants than more shallow soils. Soil depth is another important variable for suggesting suitability of tree species for a plantation. The depth is important for the penetration of the roots of plant or tree species. Four depth classes, *vis.*, Moderately Deep, Deep, Shallow and Very Shallow have been mapped in Ravi Riverscape. The distribution of area under different soil depth classes is given in Table 1.14 and Fig. 1.12.

Table 1.14 - Distribution of Area under Different Soil Depth Classes in Himachal Pradesh

Sr. No.	SOIL DEPTH	AREA (km^2)
1	Deep	1002.22
2	Moderately deep	1014.17
3	Shallow	3012.38
4	Typic udorthents	12.23
TOTAL		**5041.00**

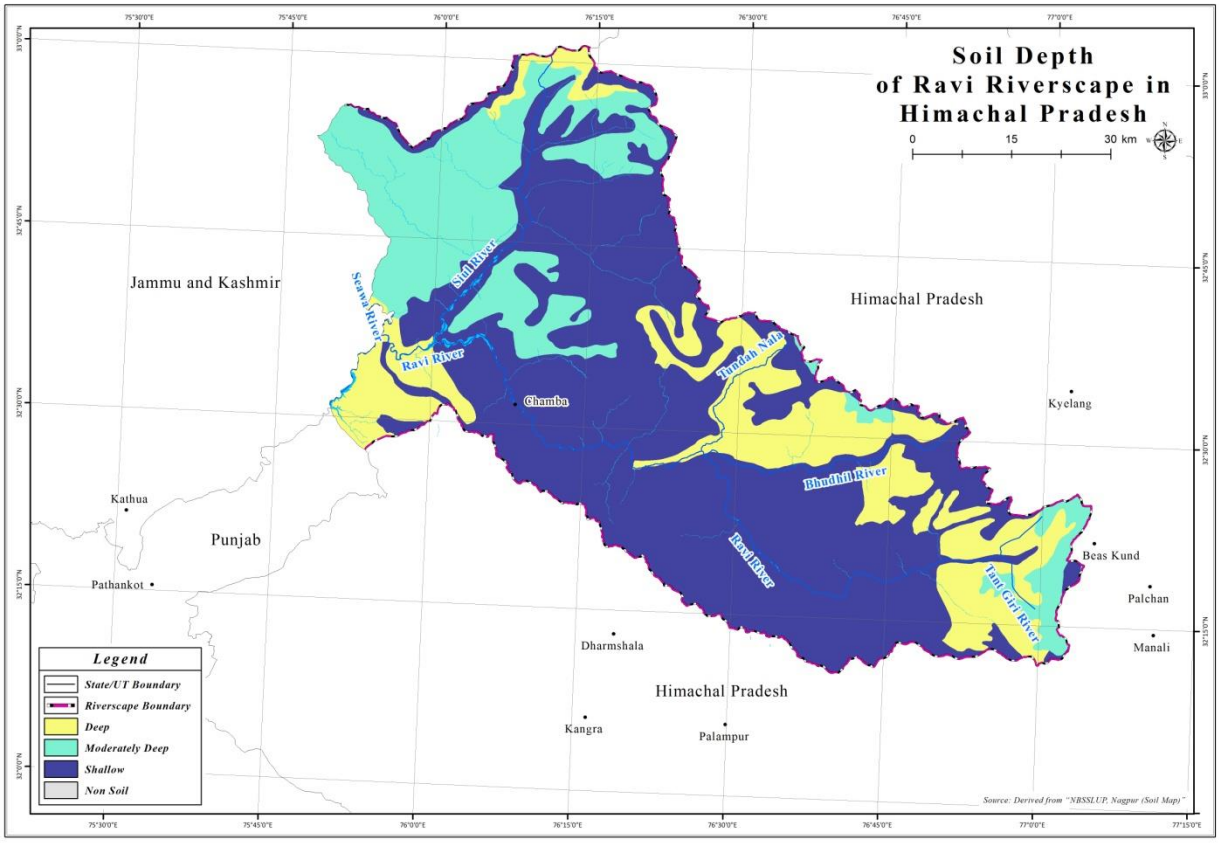


Fig. 1.12 - Soil Depth of Ravi River in Himachal Pradesh

(H) Soil Erosion

Human activities caused by intensive agriculture, deforestation, construction/ widening of roads, construction of hydroelectric projects, urban sprawl and erratic climatic conditions

are some of the prominent factors responsible for soil erosion in the mountainous catchment of Ravi River. A total five categories of erosion classes have been mapped in the riverscape, *viz*., < 5 t ha^{-1} yr^{-1}; 5 t ha^{-1} yr^{-1} to <10 t ha^{-1} yr^{-1}; 10 t ha^{-1} yr^{-1} to 20 t ha^{-1} yr^{-1}; >20 t ha^{-1} yr^{-1} to <40 t ha^{-1} yr^{-1}; and ≥40 t ha^{-1} yr^{-1}. An area of 139.26 km^2 falls under non-soil category. These areas may not be suitable for forest plantations. The distribution of areas under different erosion classes and their area is given in Table 1.15 and Fig. 1.13.

Table 1.15 - Distribution of Area under Different Soil Erosion Categories in Himachal Pradesh

Sr. No.	SOIL EROSION	AREA (km^2)
1	<5	776.36
2	5 - <10	14.34
3	10 - <20	636.34
4	20 - <40	1049.13
5	≥40	1152.05
6	Non Soil	1412.78
TOTAL		**5041.00**

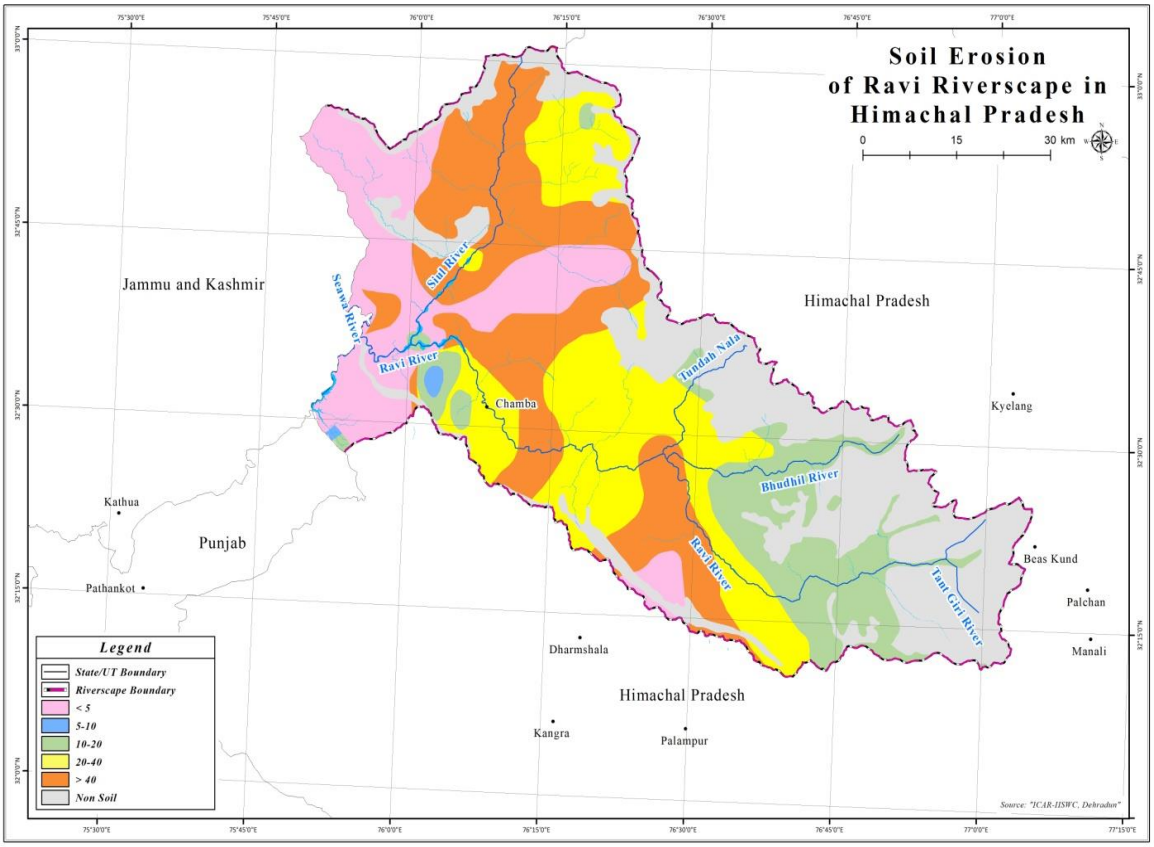


Fig. 1.13 - Soil Erosion of Ravi River in Himachal Pradesh

(I) Forest Type

The vegetation type information is most important in suggesting suitable sites based on areas which do not have dense forests cover or which are falling in scrubs and grasslands along the river banks. Distribution of Area under Different Forest Types Categories is described in Table 1.16 and Fig. 1.14.

Table 1.16 - Distribution of Area under Different Forest Types Categories in Himachal Pradesh

Sr. No.	FOREST TYPE	AREA (km^2)
1	Dry alpine forest	64.69
2	Himalayan moist temperate forest	1147.27
3	Himalayan dry temperate forest	63.49
4	Sub-tropical pine forest	311.88
5	Tropical dry deciduous forest	25.6
6	Sub-alpine forest	80.84
7	Moist alpine forest	6.95
8	Scrub	196.3
9	Non forest	3143.98
TOTAL		**5041.00**

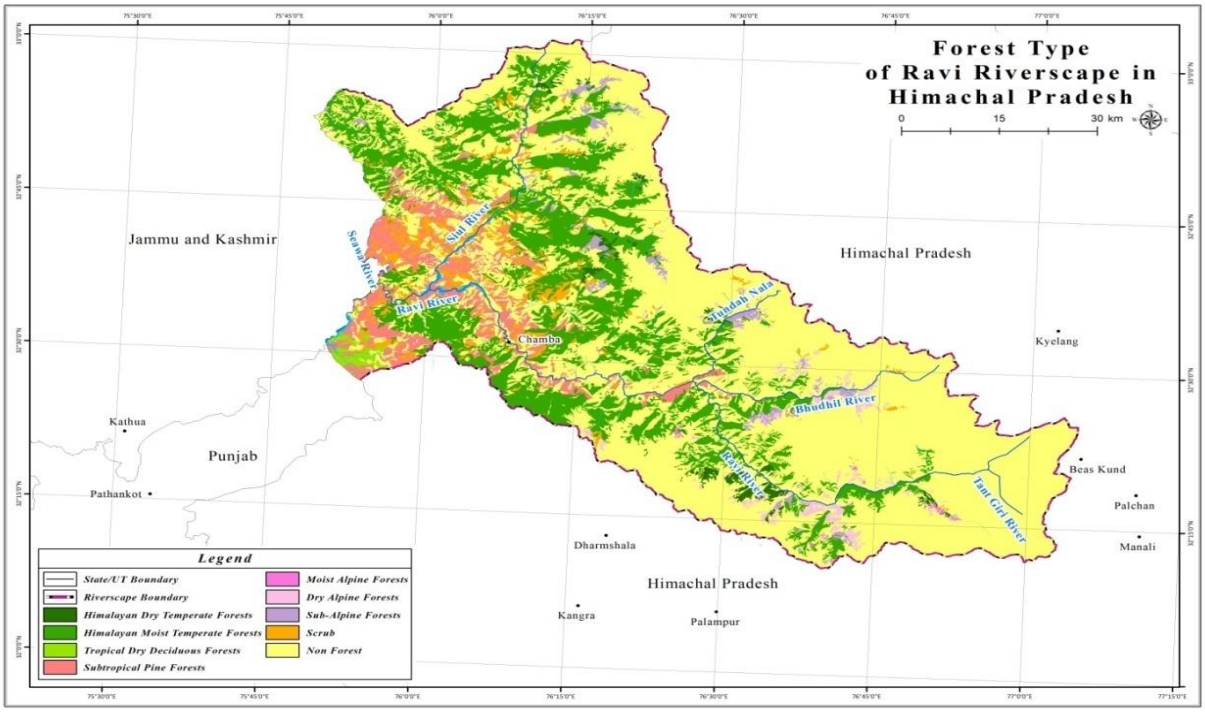


Fig. 1.14 - Forest Type of Ravi River in Himachal Pradesh

(J) Forest Cover

The dense forest occupied the highest cover with 794.75 km^2 area. Moderately Dense forests occupy 511.48 km^2 areas. In Himachal Pradesh distribution of area under different forest cover categories is described in Table 1.17 and Fig. 1.15.

Table 1.17 - Distribution of Area under Different Forest Cover Categories in Himachal Pradesh

Sr. No.	FOREST COVER	AREA (km^2)
1	Dense forest	794.75
2	Moderately dense forest	511.48
3	Open forest	394.49
4	Scrub	196.30
5	Non forest	3143.98
TOTAL		**5041.00**

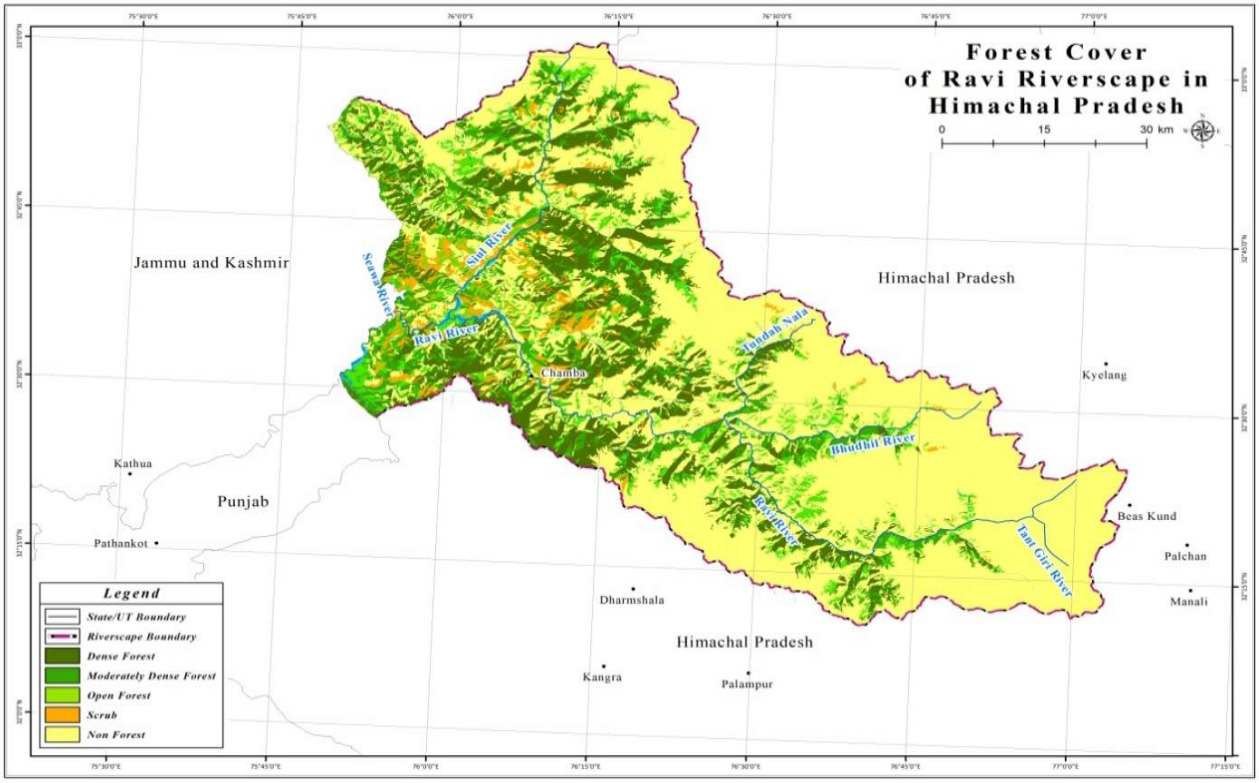


Fig. 1.15 - Forest cover of Ravi Riverscape in Himachal Pradesh

(K) Priority Treatment Area

For identifying of priority areas in three priority categories, viz., 'High', 'Medium1 and 'Low' for the proposed treatments/forestry interventions in the Ravi Riverscape and selection of

appropriate models, GIS-assisted geospatial analysis and modeling were used. Priority areas were delineated Himachal Pradesh and described in Table 1.18 and Fig. 1.16.

Table 1.18 - Prioritized Area in Himachal Pradesh

Sr. No.	PRIORITY	AREA (km^2)
1	High	2247.93
2	Low	1588.41
3	Moderate	1204.66
TOTAL		**5041.00**

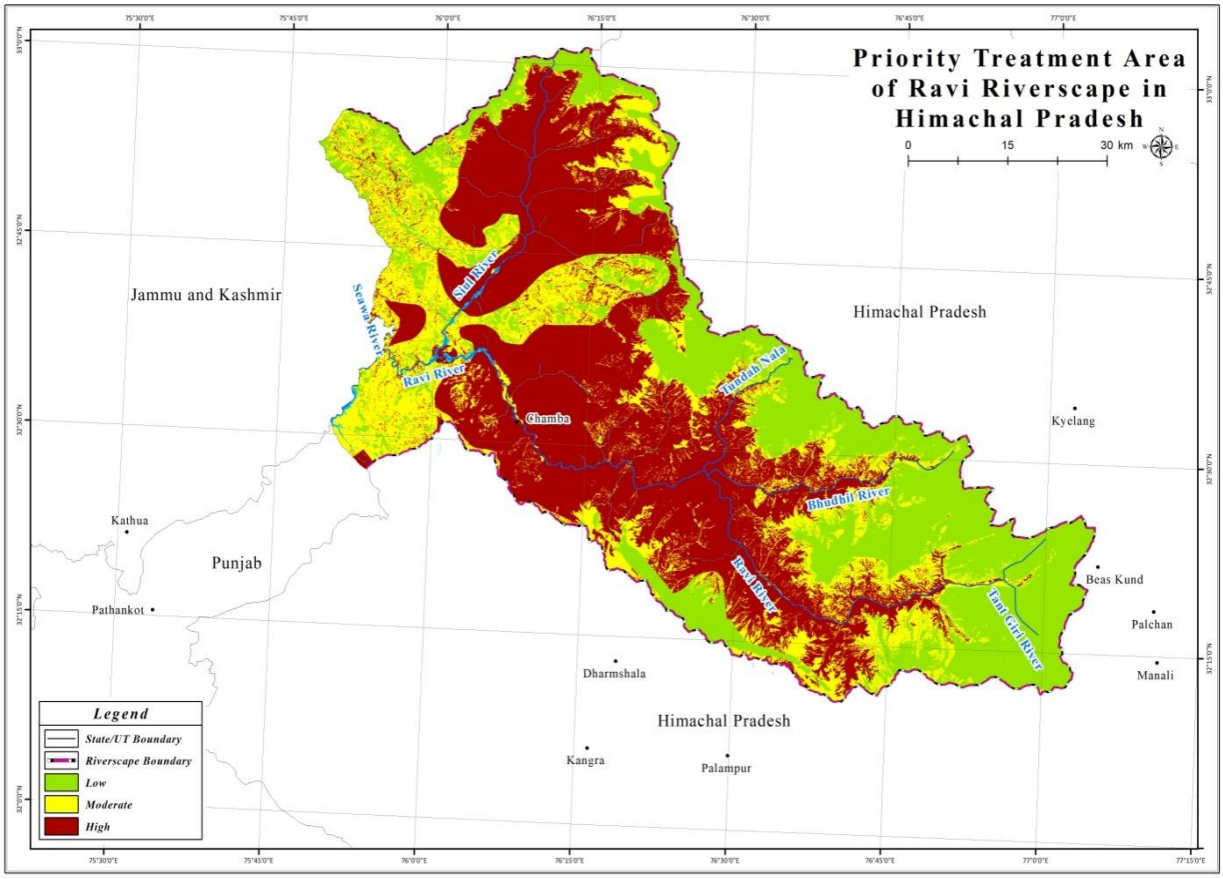


Fig. 1.16 - Priority Treatment Area of Ravi Riverscape in Himachal Pradesh

1.4 Proposed Forestry Interventions

In general, following guidelines would be applicable to all proposed Plantation Models meant for three different Landscapesviz. Natural, Agriculture and Urban Landscape and Three types of Conservation Interventions viz. Soil & Water Conservation, Riverine and Riparian Management, and Wetland Management within the riverscape:

a) All the Models/ Interventions are prescribed which come under Forestry Interventions in proposed DPR of Rivers.

b) Native species of trees, shrubs, herbs and grasses would be selected for proposed treatment models/ plantations in consultation with stakeholders of the respective States/UT. Traditional and prominent horticultural and ornamental species those under cultivation in the region for quite sometime, are proposed in the Agriculture and Urban Landscapes. Mixed plantations are proposed as far as possible instead of monoculture for enhancing plant diversity and greater ecosystem services. The species are proposed according to their occurrence in the altitudinal zones however, Implementing Agencies may plant site specific species also.

c) Suitable native species suggested for different plantation models are finalized after due consultation with Forest Department and other stakeholders of concerned States/UTs. Native species proposed for plantation under each treatment models are provided in the following section. In addition, landscape-wise model description has been further supplemented with the species-wise attributes and model-wise listing in Annexure 3 and Annexure 4, respectively

d) The necessary preparations for planting works including digging of pits would be completed two-three months before the onset of monsoon or planting season. However, the period between pit digging and scheduled planting time would not be more than four months so that run-off of soil by wind and water could be minimized.

e) Appropriate quantity of farmyard or organic manure or AM would be applied to boost plant growth in nurseries and plantation sites. Eco-friendly measures (i.e. physical or mechanical methods, use of natural products, etc.) for weed and pest control would be adopted without resorting to the use of synthetic chemicals

f) Plantation sites would be protected against all types of biotic disturbances and abiotic stresses so as to effectively safeguard planted material for three years through fence, watch and ward, as well as local public awareness programmes and their active involvement.

g) The Implementing Agency should either develop modern and centralized nurseries or identify various certified Research Institutes, Universities, NGOs, Institutions and progressive farmers for supply of best quality planting material.

h) The Schedule of Rates (SoR) is adopted from prevailing SoR of respective States/UTs. For Himachal Pradesh, SoR of Shimla Forest Circle for the year 2012-13 @ wage rate of Rs.150/ with increase of 66.66% i.e., Rs. 250/-, for J&K UT SoR of 2017 @ Rs. 225/- has been applied. Also an increase of 7% has been added each year i.e., 2nd year onwards to compensate inflation.

i) The budget will be provided after submission of Annual Plan Operations (APO) for each year. So the prevailing wage rate will be applicable whenever DPR is

implemented. Also site can be changed as per the availability at the time of implementation wherever required.

j) In Himachal Pradesh, further 25% hike in wage rates would be applied for Tribal Areas

k) The fencing cost has been calculated on average basis of enclosure of area to the extent of 5 hectare and average carriage lead is taken as 1 km (up & down)

l) The nursery time for plants in multitier model is taken on average basis i.e., 1.5 – 4.5 year so average is 3 years, for calculating the norm. Also the plant cost is taken from the norm prescribed by the Forest Department of respective States.

m) These cost Norms indicate the upper limits. The expenditure will be booked under various items shown in the detailed models as per actual work done in the field as per Schedule of Labour rates of the respective States/UTs and will not exceed these Departmental Norms.

n) The suggestive cost models are to create multistoried forest cover for improving the bio-diversity of the area which in turn conserves the water and soil in-situ.

o) In *Lantana* eradication models or wherever Lantana removal is involved, the Cut Root Stock (CRS) method should be adopted.

p) The fencing work includes the 4-strands of barbered wire with interlacing of thorny bushes.

q) In Fire Protection Model, as area is virtually targeted, hence Implementing Agency should rotate fire protection operations in areas of the Division so that each selected area takes operations after 3 years.

r) In Agriculture models the guidelines of Sub-Mission on Agroforestry (SMAF) of Central Government should be considered as being adopted in States and UT.

s) Under Urban Landscapse, the Seechewal Model (Punjab) for bio-remediation and bio-filteration may be taken into consideration.

t) Also in Urban Landscape, Eco-Park Development, Institutional Plantation and Riverfront Development models can be converged with Nagar Van Yojna as launched by GoI.

u) In Soil and water conservation models, the watershed approach and techniques should be adopted for desired results. For this intervention the Annual Plan Operation (APO) should be submitted each year with the proposal of micro plan of specific sites with detailed estimates.

v) In Riverine and Riparian Management and Wetland Management models, areas shown in budgetary provisions are virtual and concerned Implementing Agency (IA) should

clearly mention the proposed activities in Annual Plan operation (APO) to be taken up in particular area with detailed microplan and estimates.

w) Plantation models are for the general areas as proposed by the Territorial Divisions but for the protected areas, two models under Conservation Intervention *viz*. Riverine and Riparian Management and Wetland Management are propsed.

x) The prescribed models, identified sites, area of the sites, species and rates may be modified to suit local conditions at the time of implementation of project and the concerned conservators of forests shall exercise the power to approve such changes as and when requires.

y) **Cost Indexing:** The project costs have been worked out on the basis of rate prevalent during year 2019-20 in the respective State/UTs and 7% escalation in the project cost during the subsequent years has been incorporated in anticipation of the cost escalation in future. However, actual project cost at the time of implementation on yearly basis shall need revision as per the change in Wholesale Price Index (WPI) on year to year basis. The Conservator of Forest may be empowered to revise the project cost accordingly for the quality desired output of the project.

1.4.1 Natural Landscapes

Proposed treatment models in natural landscape is in mountainous tract/ hills of Himachal Pradesh. Elaborate details on various treatment models included in the present DPR is presented in the following section.

(A) Treatment Models for Natural Landscape in Himachal Pradesh

As already stated, various natural land use and land cover categories together constitute the largest area of the Ravi Riverscape and it is represented by diverse forests, alpine pastures, scrubs, snow cover/ glaciers, rivers, wetlands, etc. Thus, the maximum number of treatment models has been proposed in the mountainous/ hill portion of the riverscape. Interventions are proposed to be implemented in the entire upper basin of the Ravi River and its tributaries. Primarily, these models would be applied on forest lands under the control of SFD. The proposed treatment sites would mainly include areas under open forests, scrubs, grasslands, and alpine pastures or along the river and its tributaries. Details of each of the 13 treatment models prescribed in the natural landscape of Himachal Pradesh are presented below one by one in Table 1.19.

Table 1.19 - Models proposed for Natural Landscape of Ravi Riverscape in Himachal Pradesh

Model number	Name of Model	Brief Description
RV/HP/NL/01	Sub-Alpine Conservation	The Sub-alpine and Moist alpine zones are located between 3,600-4,500 m amsl, and the temperature remains below 5° C for 6 months in a year. The active plant growth season is of almost 4-6 months,

		vegetation is dominated by grasses and herbs with scattered shrubs. Dense cover in some patches is usually formed by a low deciduous Scrub. Under this model, it is proposed to conserve and augment vegetation of the alpine meadows. Conservation of native species and livelihood generation for local communities will be the main concern. The Working Plan related to conservation practice of respective Territorial Forest Division and Wildlife Management Plan of protected areas will be applicable. The State's policy on the collection of medicinal and aromatic plants is regulative and accordingly the benefit will be shared with local communities. Under this model, medicinal plants will be planted at the rate of 2,400 plants/ha in the blank areas. Root slips/ seeds of native grasses will be put in continuous contour strips immediately after melting of snow in 600/ha patches. At least two years nursery period and third year planting in the field along with grasses are required by the high altitude medicinal and aromatic plants. It will be followed by two years maintenance. After 5th year onwards, harvesting can be started sustainable manner.
RV/HP/NL/02	Sub-Alpine Enrichment	The Sub-Alpine zone occurs between 2,900 - 3,600 m amsl in the Ravi Riverscape, and is covered with snow for 4-5 months. The temperature remains below 5° C for around 4 months in a year. Vegetation in sub-alpine zone is dominated by herbs, grasses and shrubs of *Rhododendron* spp., *Rosa* spp., *Salix* spp., *Lonicera* spp., Bhoj Patra *(Betula utilis)*, etc. Area is slopy and generally soil depth is very low. Under this model, it is proposed to conserve and augment vegetation in sub-alpine zone by adopting specific interventions to enrich such areas. Conservation and development of native species and livelihood generation for local communities will be the major focus. Conservation and enrichment practices as prescribed in the Working Plan of respective Territorial Forest Division /Wildlife Management Plan of a protected area will be applicable. The State's policy on medicinal plants would regulate the collection of medicinal and aromatic plant species in protected areas in accordance with the rights of local communities. In this model, native trees @ 200 plants/ha at 6 m x 8 m spacing and medicinal plant species @ 800 plants/ha at 6 m x 8 m spacing in 200/ha patches will be planted in blank areas. The high altitude tree species requires around 2.5 years nursery period and planting will be done in the 3rd year. To synchronize planting of trees and medicinal plants in the 3rd year, nursery of high attitude medicinal plants will be raised in 3rd year onwards. The plants will be maintained in the field during 4th, 5th, 6th and 7th year of project implementation.
RV/HP/NL/03	Temperate Conifer Forest	The moist temperate area lies between 1,800 - 3,500 m amsl. This zone comprises, mainly of conifer species. However, blank patches too occur at several places which will be taken up for proposed treatment. In some areas, especially in fir and spruce forests, soil is covered with a thick layer of humus as the decomposition rate is very slow in these areas. So Temperate Conifer Forest Model is suggested as treatment model for these areas.

		Planting of 300/ha plants of various tree species and 300/ha shrub species will be carried out per ha. In addition, 300/ha patches of medicinal plants with 1200 plants/ha will also be planted out in the treatment site. The small stream or *nallah* facing side of the treatment area will be planted with two rows of hill bamboo at 2 m x 2 m spacing with 200/ha plants of hill bamboo. Conservation and development of native species and livelihood generation for local communities will be the major focus. The State's policy on medicinal plants would regulate the collection of medicinal and aromatic plant species in protected areas in accordance with the rights of local communities. Around 3 years of nursery period is required for most of the conifer plants and 4th year onwards planting will be done. To synchronize planting of trees, medicinal herbs and shrubs in 4th year, the nursery for selected herbs and shrubs will be raised 2nd year onwards. The plants will be maintained in the field during 5th, 6th and 7th year of the project implementation.
RV/HP/NL/04	Temperate Mixed Forest	The moist temperate forest area is situated between 1,800 - 3,500 m amsl. *Aesculus indica*, *Quercus oblongata*, *Q. floribunda*, *Q. semecarpifolia*, *Alnus nitida*, *Acer caesium*, *A. pictum*, *A. cappadocicum*, *Betula utilis*, *Betula alnoides*, *Ulmus wallichiana*, *Pinus wallichiana*, *Cedrus deodara*, *Picea smithiana*, *Abies pindrow*, *Abies spectabilis* and *Cupressus torulosa* are the dominant species of the area. Most of these species are found in association of each other. This zone is often characterized by degraded stretches along the river banks running close to the area of dense temperate forests, mainly of conifers. During winter this zone experiences plenty of snowfall and rainfall with cool climate. Snow lasts till spring season. The soil in many places is shallow, exposed and prone to erosion. This zone is heavily grazed by domestic animals and cause huge damage to the vegetation. Severe soil erosion, resulting in damage to vegetation is caused by road construction and other developmental activities. There is heavy dependence of local communities on Oak fodder within Ravi Riverscape. Further, owing to several famous tourist spots *viz*., Chamba, Dalhousie, Khajjiar, Dharamshala, etc. and the enhanced tourism activities in such areas within the riverscape cause damage to vegetation and disturbance to wild fauna. Temperate mixed forest treatment model has been proposed specifically for the blank and degraded patches within the temperate zone. Planting of trees @300/ha belonging to conifers and broadleaved species will be carried out in the blank and degraded patches. In this model preferably broadleaved species will be planted in general and conifer species can be planted on the ridges and shallow soil depth area. The native shrubs @300 plants/ha will be carried out in between the tree planted. The medicinal plants will also be planted in patches @ 4 plants/ patch and that means planting of total of 1,200 medicinal plants/ ha. The small stream or *nallah* facing side of the treatment site will be planted with two rows of hill bamboo @ 200/ha at 2 m x 2 m spacing. Conservation and development of native species and livelihood generation for local communities will be the major focus. Around 3 years of nursery period is required for most of the conifer plants and 4th year onwards planting will be done. For producing quality nursery stock of desired

		species, native zone soil will be used in conifer species and VAM will be added in shrubs and herb either species specific or as consortium. To synchronize planting of trees, medicinal herbs and shrubs in 4th year, the nursery for selected herbs and shrubs will be raised 2nd year onwards. The plants will be maintained in the field during 5th, 6th and 7th year of the project implementation. The State's policy on medicinal plants would regulate the collection of medicinal and aromatic plant species in protected areas in accordance with the rights of local communities.
RV/HP/NL/05	Pasture and Grazing Land Development	These areas lies between 800- 2,800 m amsl, particularly on southern slopes and around habitations are characterized by pasture and grazing lands. During winter this zone experiences plenty of snowfall and rainfall with cool climate. 1,500 - 2,000 mm. is annual precipitation, snow lasts till spring season. Particularly in moderate to steep slopes soil is shallow, exposed and prone to erosion. The vegetation of this zone is heavily grazed by livestock results into heavy soil erosion. Besides disturbance by livestock, road construction and other developmental activities also cause significant soil degradation and damage to native flora by proliferation of invasive alien species. The local communities are heavily dependent on these grasslands in the Ravi Riverscape. Enhanced tourism activities severely affect several popular tourist destinations *viz*., Chamba, Dalhousie, Khajjiar, Dharamshala, etc. causing damage to Flora and disturbance to Fauna. Under this model, pasture and grazing land development are proposed for protection, development and enrichment of areas within this zone. Suitable grass species will be planted/ sowing of seeds after carrying out necessary land development works like trenching/ terracing/ moisture conservation measures, etc. besides removal of weeds and unpalatable grasses. The proposed treatment model mainly includes plantation of native and nutritionally important grass species. In this model, grass sowing in furrows/ strips of 100 cm x 30 cm x 5 cm along contours at interval of 2 m apart is proposed. Selected species will be raised / maintained in the nursery during 1st year and planting will be done in the second year. The grasses will be replenished in the field during 3rd and 4th year.
RV/HP/NL/06	Himalayan Chir Pine Forest	This zone lies in mid hill region of Himachal Pradesh and is dominated by Chir pine. The altitude range is between 800 - 1,800 m amsl and annual rainfall varies from 1,200 - 1,800 mm. High temperatures and humidity conditions prevail during summer. Ground is densely covered with pine needles and such areas are prone to forest fires. Grasses flush during monsoon season. High rate of sedimentation in Ravi River and its tributaries due to severe soil erosion in this zone. This is one of the major causes of siltation of dams and floods in Punjab plains. Open and degraded forests on southern aspect with sparse vegetation coupled with agriculture on steep slopes, construction and developmental activities are prominent reasons behind large scale soil erosion in this zone. Heavy rainfall during monsoon season and modest rainfall during the winter season are experienced in this region. Snowfall rarely occurs in cooler aspects of higher reaches, if so it stays for a few days only. Most of the rainwater run off the streams washing away

		top soil especially on sloppy sites. The steep slopes having acidic and shallow soil, while valleys have deep soil. The biotic pressure in terms of livestock grazing, and fuel wood and tree fodder collection is conspicuous. Pastures, grazing lands, checking soil erosion and siltation into Ravi Riverscape can immensely be improved by Suitable forestry interventions. For such areas in this zone, the Himalayan Chir Pine Forest Model is proposed. Grass species such as *Heteropogon contortus*, *Chrysopogon fulvus*, etc. are proposed to be sown in the treatment site, particularly towards the river or *nallah* side. *Pinus roxburghii* will be planted mainly in drier sites with shallow soil depth whereas *Quercus oblongata*, *Lyonia ovalifolia*, Bamboo spp., etc. on moist sites are proposed to be planted at 5 m x 5 m spacing. A total of 300 plants of tree/ha, 100 bamboo species /ha along with 300 plants of shrubs/ha and 800 patches of grasses will be planted 2m apart in staggered fashion. 2 years nursery period is require for Chir pine and associated broadleaved species and 3rd year will be planting period. For producing quality nursery stock of desired species, native zone soil will be used in conifer species and VAM will be added in shrubs and herbs either species specific or as consortium. The plants will be maintained in the field during 4th, 5th and 6th year. The fire lines of 5m width both sides along the fencing of the plantation area be maintained twice a year.
RV/HP/NL/07	Himalayan Mixed Forests	This zone occurs in mid hill region on the northern aspect, and is dominated by broadleaved species with some Chir pine in exposed areas. 800 - 1,800 m amsl is altitudinal variation, 1,200 - 1,800 mm is annual rainfall in the region. High temperatures and humidity is common during the summer season. In areas wherein Chir pine species is around 50%, the ground is mostly covered with pine needles and area is prone to forest fires. Grasses in slopes flush during the monsoon season. High rate of sedimentation in Ravi River and its tributaries due to severe soil erosion in this zone. Moderately dense to open forests on the northern aspect coupled with agriculture on terraces along moderately steep slopes, and construction and development activities are primary reasons for large scale soil erosion in this zone. Heavy rainfall during the monsoon season and modest rainfall during the winter season is prevalent. Most of the rainwater flows down the streams washing away top soil especially on slopy sites. The soil is neutral to acidic in nature and shallow on slopes while valleys have deep soils. The biotic pressure i.e., livestock grazing, and collection of fuel wood and tree fodder) is severe. Appropriate forestry interventions in this zone can immensely help in improvement of the zone and also river flow. The Himalayan Mixed Forest Model is recommended for this zone. Grass species such as *Heteropogon contortus*, *Chrysopogon fulvus*, *C. serrulatus* etc. will be sown in the part of treatment site, particularly on the ridges. The treatment area will be planted with broadleaved species like *Quercus oblongata*, *Lyonia ovalifolia*, *Toona ciliata*, *Syzygium cumini*, *Grewia optiva*, *Pyrus pashia*, *Albizia* spp., *Phyllanthus emblica*, *Holoptelea integrifolia*, *Ficus* spp., *Punica granatum*, *Bauhinia variegata*, etc. Plants will be planted at 5 m x 5 m spacing. A total of 300 plants of tree

		species/ha., 300 plants of shrubs/ha and 200 patches of 2 m x2 m apart grasses on the ridges/degraded sites will be planted. One and half year of nursery period is required for Broadleaved species of this zone and 3rd year onwards planting will be done. For producing quality nursery stock of desired species VAM will be added either species specific or as consortium. The plants will be maintained in the 4th to 6th year. The fire line of width 5m both side along the fencing of the plantation area be maintained twice a year.
RV/HP/NL/08	Sub-Tropical Dry Deciduous Forests	This zone are found in low hill region of Himachal Pradesh and dominated by broadleaved deciduous species. 300 - 900 m amsl is altitude ranges. 1,200 - 2,000 mm annual rainfall is experiences in this zone. During summer months Several broadleaved species shed their leaves, growing in this zone. The zone is represented by deep soil and moderate slope and experiences heavy rainfall during the monsoon season and modest rainfall during the winter season. Heavy rains during the monsoon season transport silt from these areas through number of seasonal water channels, *nallahs*, rivulets, etc. to the Ravi River causing siltation and floods in downstream areas. Besides this, agriculture on slopes and construction and developmental activities are the main reasons for soil erosion from these areas. A large part of rainwater flows down the streams within a few hours of rainfall as surface run off. The soil is shallow on slopes while valleys have deep soil depth. The biotic pressure i.e., livestock grazing, fuel wood and tree fodder collection is significant in this zone. To check soil erosion, improve vegetation, and improvement in the e-flow of the Ravi River and its tributaries, forestry interventions is must. The Sub-Tropical Dry Deciduous Forest Model is recommended in this zone. Under this model, it is proposed to plant 300 plants of broadleaved tree species or bamboo species. 300 shrubs at 5 m x 5 m in between the tree rows and strong soil binding grasses like *Arundinella nepalensis*, *Apluda mutica*, *Chrysopogon fulvus* and sedges like *Carex* spp., *Cyperus* spp., etc. will be planted on the river or *nallah* facing side of the treatment site. In case of trees, a mixture of timber species like *Dalbergia sissoo*, *Senegalia catechu*, *Adina cordifolia*, etc. along with medicinal trees like *Terminalia* spp., *Phyllanthus emblica*, *Oroxylum indicum*, *Sapindus mukorossi*, etc. will be planted at 5 m x 5 m spacing. Management practices and conservation measures as prescribed in the Working Plan of the respective Territorial Forest Division or the Wildlife Management Plan of the protected area will be applicable. The State's policy on medicinal plants would regulate the collection of medicinal and aromatic plant species in protected areas in accordance with the rights of local communities. 1st year and 2nd year nursery will be established and 3rd year onwards planting will be done. VAM will be added either species specific or as consortium for producing quality nursery stock of desired species. Subsequently, the plantation will be managed during next three years. The fire line of width 5m both side along the fencing of the plantation area be maintained twice a year.
RV/HP/NL/09	Eradication of *Lantana*	Invasive alien species are plants those hamper regeneration and growth of native species, thereby replacement of native plant species

	(> 50%)	coupled with loss of biodiversity, forage, habitat, aesthetics and productivity of native species. Owing to considerable area of this zone under the influence of lantana, tangible and intangible benefits from lower temperate to sub- tropical forests within the Ravi Riverscape have been adversely affected. The area for the proposed model referred as 'Eradication of *Lantana* (>50%)' covers forest sites between 300 - 1,200 m amsl wherein the topography is with gentle slopes. Such areas have sub-tropical to lower-temperate climate with around 1,000 - 1,500 mm annual rainfall. Soils are generally fertile and moderately deep. The propose treatment area for this model usually has open or moderately dense forest or scrub vegetation. Luxuriant growth of *Lantana camara* forms dense undergrowth in the forest suppressing the native vegetation of that area. It is proposed to cut and manually uproot above stated invasive species in treatment sites as per the prescription of CRS (Cut Root Stock) method for complete eradication of this obnoxious weed. These areas after *Lantana* eradication will be planted in the third year of project implementation. Grass species such as *Heteropogon contortus*, *Chrysopogon serrulatus*, etc. will be sown in the part of treatment site. The treatment area will be planted with broadleaved species like *Toona ciliata*, *Syzygium cumini*, *Grewia optiva*, *Pyrus pashia*, *Albizia* spp., *Phyllanthus emblica*, *Holoptelea integrifolia*, *Ficus* spp., *Punica granatum*, *Bauhinia variegata*, *Dendrocalamus* spp. and *Bambusa* spp. etc. Plants will be planted at 4 m x 4 m spacing. A total of 600 plants of trees and bamboos /ha along with 600 patches of 4x4 m apart grasses on sites will be planted. Throughout the treatment area alternate rows of bamboo and Broadleaved species will be planted. Two and half years of this zone require nursery period to produce sturdy plants and 3rd year onward planting will be done. VAM will be added either species specific or as consortium for producing quality nursery stock of desired species. The plants will be maintained in the 4th to 6th years.
RV/HP/NL/10	Control/ Removal of Invasive Species or <50% Lantana	Invasive alien species are plants those hamper regeneration and growth of native species, thereby replacement of native plant species coupled with loss of biodiversity, forage, habitat, aesthetics and productivity of native species. Owing to considerable area of this zone under the influence of invasive and alien species, tangible and intangible benefits from sub-tropical to sub-temperate forests within the Ravi Riverscape have been adversely affected. The area for the proposed model referred as 'Control/ Removal of Invasive Species' covers forest sites between 300 - 1,200 m amsl wherein the topography is with gentle slopes. Such areas have sub-tropical to lower-temperate climate with 1,000 - 1,500 mm annual rainfall. Soils are generally fertile and moderately deep. The proposed treatment area for this model usually has open or moderately dense forest or scrub vegetation. Luxuriant growth of weed species including *Lantana camara* (<50%) forms considerably dense undergrowth in the forest suppressing the native vegetation of that area. *Ageratum conyzoides* and *Parthenium hysterophorus* also cause considerable hazard especially near agriculture fields and settlements.

		It is proposed to cut and manually uproot above stated invasive species in treatment sites prior to their flowering, and immediately to be followed by planting of native plant species. In case of *Lantana* infested areas, Cut Root Stock (CRS) method will be used for control of this obnoxious weed. In case of other weeds, cuttings and removal of infested plants will be done at such a time and such a way as to cause least disturbance to soil and provide opportunity to the nearby native, economically important plants to occupy the space vacated by weeds. These areas after plantation will be intensively managed subsequently for two years to minimize the chances of their re-growth. For controlling herbaceous weeds like *Ageratum conyzoides* and *Parthenium hysterophorus*, eco-friendly measures (e.g., physical or mechanical methods, use of natural products, etc.) will be adopted without resorting to the use of synthetic chemicals. These areas after *Lantana* removal will be planted in the third year of project implementation. Grass species such as *Heteropogon contortus*, *Chrysopogon serrulatus*, etc. will be sown in the part of treatment site. The treatment area will be planted with broadleaved species like *Quercus oblongata*, *Toona ciliata*, *Syzygium cumini*, *Grewia optiva*, *Pyrus pashia*, *Albizia* spp., *Phyllanthus emblica*, *Holoptelea integrifolia*, *Ficus* spp., *Punica granatum*, *Bauhinia variegata*, *Dendrocalamus* spp. and *Bambusa* spp., etc. Plants will be planted at 5 m x 5 m spacing. A total of 400 plants of trees and bamboo/ha- a mixture of broad leaved species and bamboos will be planted. In additions, 400 patches of grasses 5x5 m apart will be planted on the proposed sites. The rows of trees and grasses will be planted alternatively. Two and half years of this zone require nursery period to produce sturdy plants and 3rd year onward planting will be done. VAM will be added either species specific or as consortium for producing quality nursery stock of desired species. The plants will be maintained in the 4th to 6th year
RV/HP/NL/11	Protection Model for Natural Regeneration	1,300 - 4,500 m amsl is characterized by dense forests, mainly conifers and Oak forests, Sub-Alpine vegetation i.e., herbs, grasses, shrubs and scattered small trees and Alpine pastures. However, blank patches too occur at several locations that can be taken up for the proposed treatment. In selected areas, especially in Deodar, Blue pine, Fir, Spruce, Oak forests and even the Sub-Alpine and Alpine areas, adequate regeneration can be observed under favorable conditions. Owing to varied disturbances by human and livestock in such areas, establishment of natural regeneration is generally poor and need immediate attention. Often, a thick layer of humus is typically present and the soil is generally moist and conducive for natural regeneration. Under this treatment model, it is proposed to protect and conserve vegetation so as to promote ample establishment and recruitment of natural regeneration. The major focus will be on protection of special areas like patches of good natural regeneration of various conifers, broadleaved species shrubs, etc. and thereby conserving

		native plant species, particularly herbs. In natural regeneration areas, cleaning operation twice a year in the month of September and March be carried out *viz.*,climber cutting, obnoxious weeds, unwanted species, pruning of plants, removing dead and dying trees. The broadcasting of desired seed be done in the closed area to supplement the natural regeneration.
RV/HP/NL/12	Fire Protection Model	This zone occurs in sub-tropical i.e., from foot hills to mid hill region of Himachal Pradesh. It is dominated by Chir pine in southern aspects and mixed vegetation in other aspects. The altitude is 800 – 1800 m amsl and annual rainfall is 1000 – 1500 mm and mostly during monsoon and some portion in winter months. This zone experiences 7-8 dry months every year making these forests highly vulnerable to fires. Even a small negligence during dry months in Chirpine dominated areas carries the great risk of igniting forest fires that spread very fast riding on the wind. Damage caused by the forest fire during 2015-16 was in 5734 ha forest in Himachal Pradesh with loss to regeneration, pole crop, and productivity and Ecosystem services, Wildlife etc. Heavy monsoon rains in the burnt out areas transport huge qualities of silt to Ravi river carrying siltation of dams and floods in Punjab plains. Effective fire control measures can help significantly in reducing the silt load in Ravi and its tributaries. For these fire prone forest area, 'Fire Protection Model' is recommended. In this model, existing fire lines are cleared of vegetation and maintained all around the forest in such a way that a compact block or area is separated from adjoining areas. These fire lines are usually cleared before the start of the fire seasons in order to avoid the spread of fires from one forest to another. Engagement of fire watchers in fire sensitive beats, Procurement of firefighting equipments and use of elide fire extinguishing balls. Construction of water harvesting and storage structure with locally available materials will be done e.g. Ponds, *Khals*, etc. Besides these, awareness campaign among rural masses particularly about overall damage by forest fires to nature flora and fauna, soil and other ecosystem services of the forest such as hydrological functions, moderation of local climate etc. influencing horticulture/ agriculture productivity of farmlands. Role of local communities in bringing down the forest fire incidences in Chir-pine zone and is very important and need to be highlighted at various levels.
RV/HP/NL/13	Plantation by Eco Task Force in Temperate Forests	Some sites in the upper Ravi River Basin have rugged topography, harsh conditions, shallow soils with low moisture content, etc. Such areas are mostly located on the southern slopes. These sites require continued presence and close supervision by planting and maintenance teams. The Eco Task Force (ETF) in the past has exhibited great success in regeneration of such harsh sites. It is proposed to utilize this unique ability of ETF in planting on such difficult sites under this DPR. A total of 1,000 ha land in such areas will be identified in the Ravi Riverscape in liaison with Himachal Pradesh State Forest Department. The selected areas may not necessarily be contiguous. The task of establishment and maintenance of proposed plantations will be carried out by the raising one more unit under this DPR to be established in Dalhousie

		area of district Chamba with over all Command Headquarters at Kufri in Shimla district already looking after the affair of two such units in Sutlej and Beas Rivers catchments in Himachal Pradesh and can handle two more with existing Headquarters. The unit will work in close coordination with Himachal Pradesh State Forest Department. One or more of the proposed plantation models amongst suggested models (RV/HP/NL/01 to RV/HP/NL/10) will be selected for replication by the ETF under this model.

Table 1.20 - List of Illustrated Species for plantations in Himachal Pradesh

Model Number	Name of Model
RV/HP/NL/01	**Herbs/Medicinal Plants:** *Aconitum heterophyllum, Aconitum violaceum, Ainsliaea aptera, Arnebia benthamii, Dactylorhiza hatagirea, Heracleum candicans, Polygonatum verticillatum, P.cirrhifolium, P. multiflorum, Fritillaria roylei, Picrorhiza kurroa, Selinum tenuifolium, Allium humile, Geranium wallichianum, Rheum australe, Rheum moorcroftianum,* and *Sinopodophyllum hexandrum, Anemone polyanthes* and *A. tetrasepala.* **Grasses and Forbs:** *Festuca pratensis, F. valesiaca, Trifolium pratense, Poa pratensis, Poa annua, Dactylis glomerata, Agrostis gigantea, A.pilosula, A. munroana, Agropyron* spp., *Calamagrostis montanensis, Koeleria* spp., *Brachypodium sylvaticum, Bromus himalaicus, B. ramosus, Danthonia cachemyriana, D. cuminsii* and *Stipa roylei.*
RV/HP/NL/02	**Trees:** *Betula utilis, Pinus wallichiana, Acer acuminatum, Corylus jacquemontii, Prunus cornuta, Quercus semecarpifolia,* etc. **Herbs/Medicinal Plants:** *Aconitum heterophyllum, Arnebia benthamii, Dactylorhiza hatagirea, Heracleum candicans, Polygonatum verticillatum, P. multiflorum, Selinum tenuifolium, Allium humile, Geranium wallichianum, Bergenia stracheyi, Phytolacca acinosa, Hyoscyamus niger, Angelica glauca, Picrorhiza kurroa, Fritillaria roylei, Sinopodophyllum hexandrum, Trillium govanianum,* etc.
RV/HP/NL/03	**Trees:** *Cedrus deodara, Pinus wallichiana, Picea smithiana, Taxus wallichiana, Cupressus torulosa,* etc. **Shrubs:** *Drepanostachyum falcatum, Daphne papyracea, Prinsepia utilis, Rosa moschata, Debregeasia hypoleuca, Cotoneaster bacillaris, Viburnum grandiflorum, V. cotinifolium, Cornus oblonga, Syringa emodi, Indigofera heterantha, Desmodium elegans, Hypericum oblongifolium,* etc. **Herbs:** *Aconitum heterophyllum, Picrorhiza kurroa, Heracleum candicans, Angelica glauca, Geranium wallichianum, Polygonatum verticillatum, Bergenia ciliata, Viola serpens, Trillium govanianum, Phytolacca acinosa, Valeriana jatamansi* and *Hedychium spicatum.*

RV/HP/NL/04	**Trees:** *Cedrus deodara, Pinus wallichiana, Picea smithiana, Taxus wallichiana, Aesculus indica, Juglans regia, Prunus cornuta, P. cerasoides, Acer caesium, A. pictum, A. cappadocicum, Carpinus viminea, Betula alnoides, Myrica esculenta, Cornus macrophylla, Alnus nitida, Ulmus wallichiana, Quercus oblongata, Q. floribunda, Q. semecarpifolia, Cornus capitata, Neolitsea pallens, Lyonia ovalifolia, Pistacia integerrima,* etc. **Shrubs:** *Drepanostachyum falcatum (Hill bamboo), Daphne papyracea, Prinsepia utilis, Rosa moschata, Debregeasia hypoleuca, Cotoneaster bacillaris, Viburnum grandiflorum, Elaeagnus conferta, Hypericum oblongifolium, Rubus biflorus, R. niveus, R. ellipticus, R. foliolosum, Zanthoxylum armatum, Deutzia staminea, D. corymbosa, Spiraea canescens, Berberis* spp., etc. **Herbs:** *Aconitum heterophyllum, Heracleum candicans, Angelica glauca, Geranium wallichianum, Polygonatum verticillatum, P. cirrhifolium, Sinopodophyllum hexandrum, Bergenia ciliata, Viola serpens, Valeriana jatamansi, Hedychium spicatum, Trillium govanianum, Ajuga* spp., etc.
RV/HP/NL/05	**Grasses and Forbs:** *Festuca pratensis, Trifolium pratense, Poa pratensis, Poa annua, Dactylis glomerata, Erianthus* spp., *Agrostis* spp., *Agropyron* spp., *Danthonia* spp. *Calamagrostis* spp., *Koeleria* spp., *Saccharum spontaneum, Chrysopogon gryllus, Arundinella nepalensis, A. pumila, Themeda anathera, Shrub, Cymbopogon distans, Setaria glauca, Alopecurus aequalis, A. nepalensis, Bothriochloa pertusa, B. parviflora,* etc.
RV/HP/NL/06	**Tree:** *Pinus roxburghii, Quercus oblongata, Lyonia ovalifolia, Dendrocalamus strictus, D. hamiltonii, Holoptelea integrifolia, Ficus benghalensis, F. racemosa, F. rumphii, Albizia* spp., *Phyllanthus emblica, Diospyros montana, Bauhinia variegata, Grewia optiva, Pyrus pashia, Mallotus philippinensis, Aegle marmelos, Punica granatum, Cinnamomum tamala, Celtis australis, Toona ciliata, Flacourtia indica and Bombax ceiba.* **Shrubs:** *Justicia adhatoda, Myrsine africana, Murraya* spp., *Tinospora cordifolia, Woodfordia fruticosa, Maesa indica, Nyctanthes arbor-tristis, Vitex negundo, Carissa opaca, Berberis* spp., *Ziziphus* spp., *Desmodium* spp., *Tephrosia hamiltonii*, etc. **Grasses and Forbs:** *Heteropogon contortus, Chrysopogon fulvus, C. serrulatus, Boerhavia diffusa, Festuca pratensis, Festuca arundinacea**,** Poa pratensis, Erianthus filifolius, Erianthus rufipilus, Agrostis gigantea, Agropyron* spp., *Phleum pratense**,** Themeda anathera, Arundo donax, Cymbopogon martinii, Phragmites karka, Bothriochloa pertusa, B. intermedia, Eulaliopsis binata, Calamagrostis* spp., *Thysanolaena maxima,* etc.
RV/HP/NL/07	**Trees:** *Quercus oblongata, Lyonia ovalifolia, Holoptelea integrifolia, Ficus* spp., *Albizia* spp., *Phyllanthus emblica, Bauhinia variegata, Grewia optiva, Pyrus pashia, Toona ciliata, Syzygium cumini, Punica granatum, Pistacia integerrima, Celtis australis, Cinnamomum tamala, Mallotus philippinensis, Anogeissus latifolia, Flacourtia indica,* etc. **Shrubs:** *Rosa* spp., *Debregeasia hypoleuca, Elaeagnus conferta, Zanthoxylum armatum, Deutzia staminea, D. corymbosa, Berberis* spp., *Ziziphus* spp., *Carissa opaca, Murraya* spp., *Desmodium* spp., *Tephrosia hamiltonii, Justicia adhatoda, Tinospora cordifolia, Woodfordia fruticosa, Maesa indica, Nyctanthes arbor-tristis, Vitex negundo,* etc. **Grasses and Forbs:** *Heteropogon contortus, Chrysopogon fulvus, C. serrulatus,*

	Boerhavia diffusa, Festuca pratensis, F. arundinacea, Poa pratensis, Erianthus filifolius, Erianthus rufipilus, Agrostis gigantea, Agropyron spp., *Phleum pratense, Themeda anathera, Arundo donax, Cymbopogon martinii, Phragmites karka, Bothriochloa pertusa, B. intermedia, Eulaliopsis binata, Calamagrostis* spp., *Thysanolaena maxima,* etc.
RV/HP/NL/08	**Trees:** *Dalbergia sissoo, Senegalia catechu, Adina cordifolia, Aegle marmelos, Terminalia* spp., *Mallotus philippinensis, Syzygium cumini, Oroxylum indicum, Sapindus mukorossi, Dendrocalamus strictus, D. hamiltonii, Bambusa bambos, B. arundinacea, Holoptelea integrifolia, Ficus* spp., *Albizia* spp., *Celtis australis, Litsea chinensis, Alstonia scholaris, Phyllanthus emblica, Diospyros montana, Bauhinia variegata, Grewia optiva, Cassia fistula, Cinnamomum tamala, Anogeissus* spp., *Bombax ceiba,* etc. **Shrubs:** *Rosa* spp., *Debregeasia hypoleuca, Zanthoxylum armatum, Myrsine africana, Deutzia staminea, D. corymbosa, Ziziphus* spp., *Carissa opaca, Desmodium gangeticum, Tephrosia hamiltonii, Justicia adhatoda, Murraya* spp., *Tinospora cordifolia, Woodfordia fruticosa, Maesa indica, Nyctanthes arbor-tristis, Vitex negundo,* etc. **Grasses and Forbs:** *Heteropogon contortus, Chrysopogon fulvus, C. serrulatus, Boerhavia diffusa, Festuca pratensis, Festuca arundinacea, Poa pratensis, Erianthus filifolius, Erianthus rufipilus, Aigrostis gigantea, Agropyron* spp., *Phleum pratense, Themeda anathera, Arundo donax, Cymbopogon martinii, Phragmites karka, Bothriochloa pertusa, B. intermedia, Eulaliopsis binata, Calamograstis* spp., *and Thysanolaena maxima.*
RV/HP/NL/09	**Trees:** *Dalbergia sissoo, Senegalia catechu, Adina cordifolia, Aegle marmelos, Terminalia* spp., *Mallotus philippinensis, Syzygium cumini, Oroxylum indicum, Sapindus Mukorossi, Dendrocalamus* spp., *Bambusa* spp., *Holoptelea integrifolia, Ficus* spp., *Albizia* spp., *Celtis australis, Litsea chinensis, Pyrus pashia, Phyllanthus emblica, Diospyros montana, Bauhinia variegata, Grewia optiva, Anogeissus* spp., etc. **Grasses/Forbs:** *Arundinella nepalensis, Apluda mutica, Chrysopogon fulvus, Boerhavia diffusa, Heteropogon contortus, Trifolium repens, Eragrostis nigra, Deschampsia* spp., *Panicum maximum, Phleum pratense, Cymbopogon citrullus, Arundo donax, Phragmites karka, Themeda arundinacea, Eulaliopsis binata, Dichanthium annulatum, Sporobolus diander, Thysanolaena maxima, Hierochloe laxa,* etc.
RV/HP/NL/10	**Grasses and Forbs:** *Arundinella nepalensis, Apluda mutica, Chrysopogon fulvus, Boerhavia diffusa, Heteropogon contortus, Trifolium repens, Eragrostis nigra, Deschampsia* spp., *Panicum maximum, Phleum pratense, Cymbopogon citrullus, Arundo donax, Phragmites karka, Themeda arundinacea, Eulaliopsis binata, Dichanthium annulatum, Sporobolus diander, Thysanolaena maxima, Hierochloe laxa,*etc. **Grasses and Forbs:** *Arundinella nepalensis, Apluda mutica, Chrysopogon fulvus, Boerhavia diffusa, Heteropogon contortus, Trifolium repens, Eragrostis nigra, Deschampsia* spp., *Panicum maximum, Phleum pratense, Cymbopogon citrullus, Arundo donax, Phragmites karka, Themeda arundinacea, Eulaliopsis binata,*

	Dichanthium annulatum, Sporobolus diander, Thysanolaena maxima, Hierochloe laxa, etc.
RV/HP/NL/11	**Trees:** No plantation proposed **Shrubs:** No plantation proposed **Herbs:** No plantation proposed
RV/HP/NL/12	**Trees:** No plantation proposed **Shrubs:** No plantation proposed **Herbs:** No plantation proposed
RV/HP/NL/13	**Eco Task Force Model**

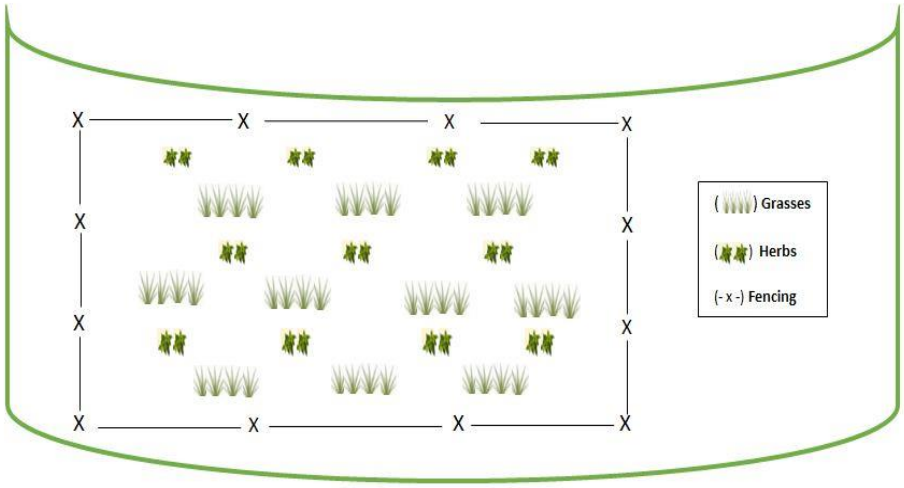


Fig. 1.17 - RV/HP/NL/01 (Alpine Conservation)

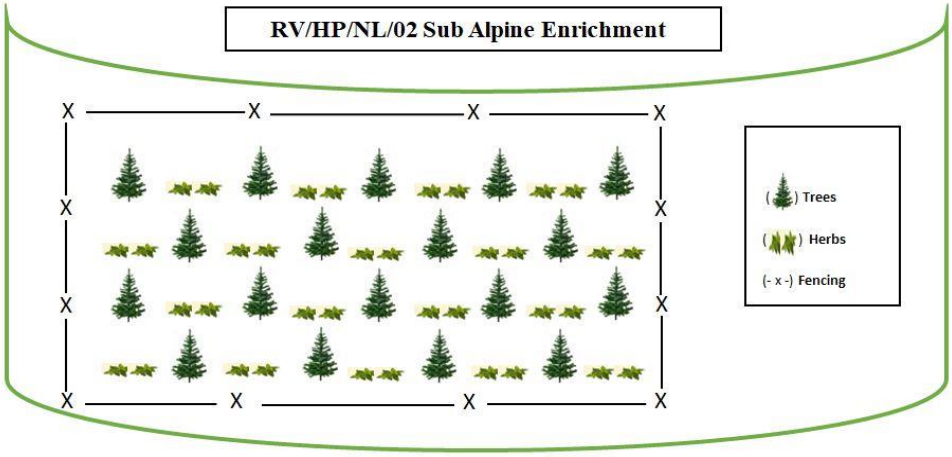


Fig. 1.18 - RV/HP/NL/02 (Sub-Alpine Enrichment)

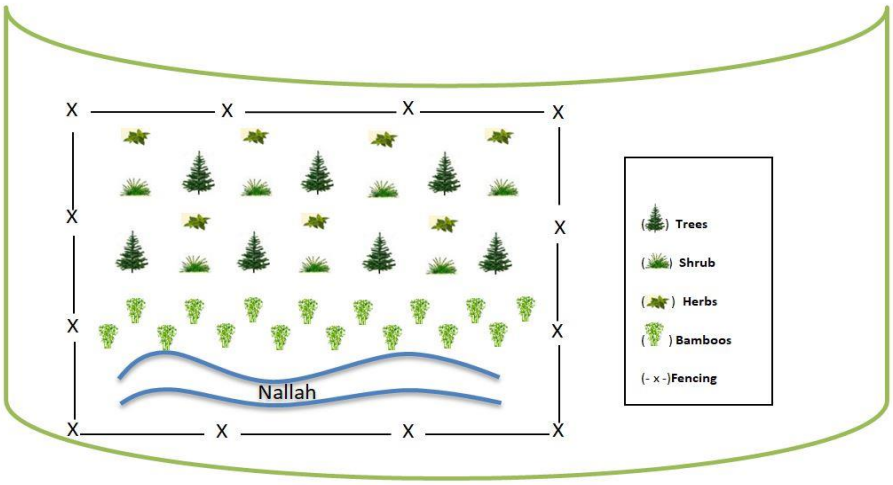


Fig. 1.19 - RV/HP/NL/03 (Temperate Conifer Forest)

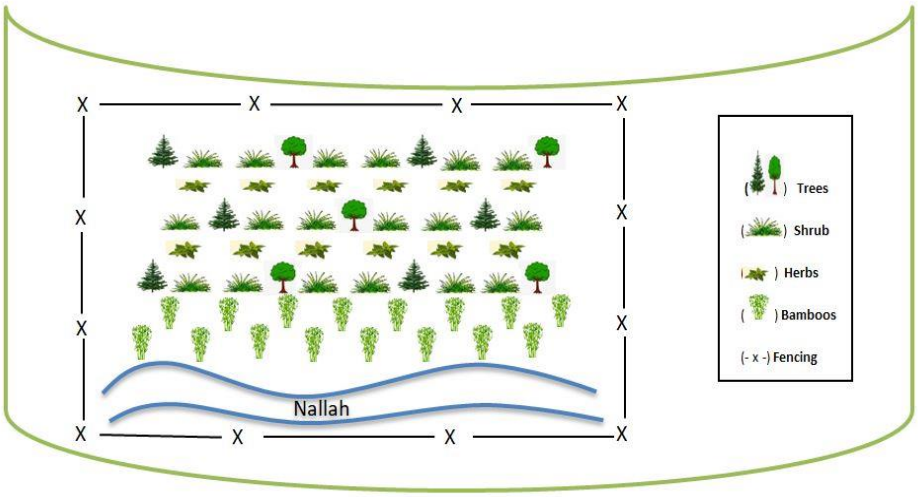


Fig. 1.20 - RV/HP/NL/04 (Temperate Mixed Forest)

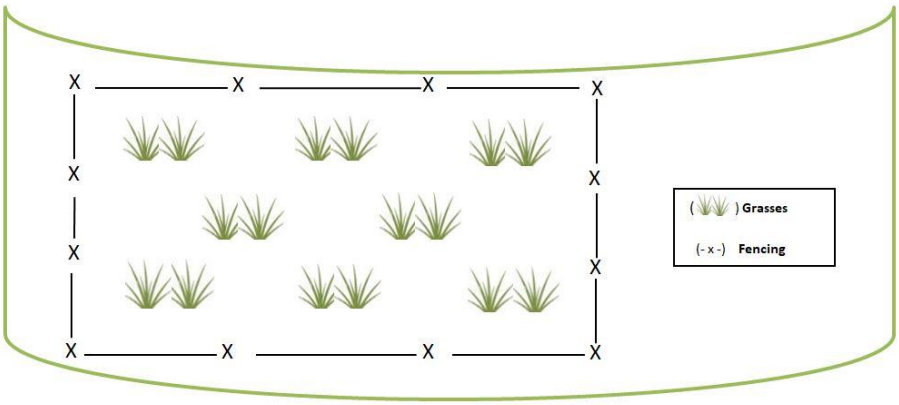


Fig. 1.21 - RV/HP/NL/05 (Pasture and Grazing Land Development)

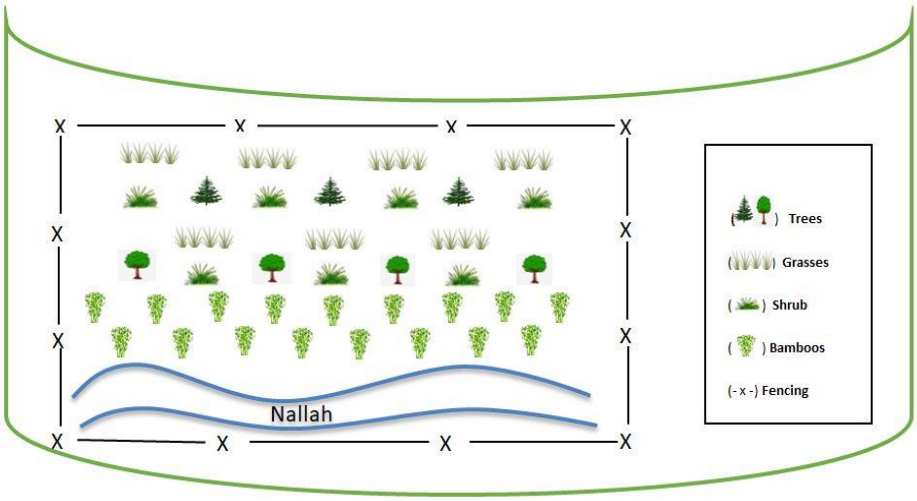


Fig. 1.22 - RV/HP/NL/06 (Himalayan Chir Pine Forest)

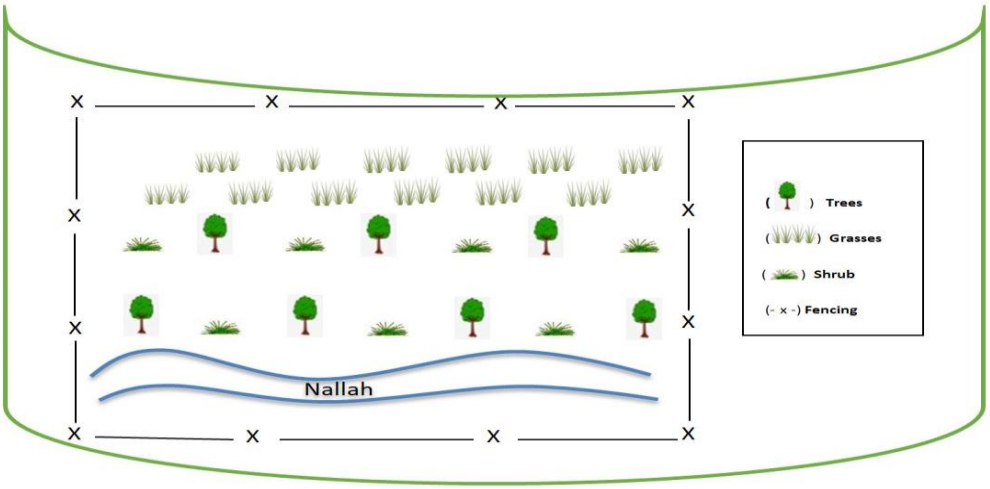


Fig. 1.23 - RV/HP/NL/07 (Himalayan Mixed Forest)

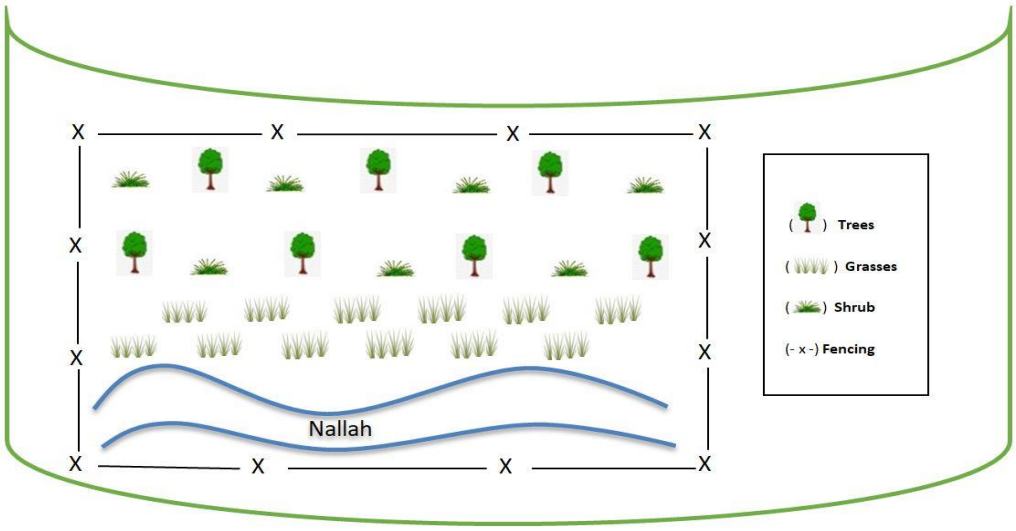


Fig. 1.24 - RV/HP/NL/08 (Sub-Tropical Dry Deciduous Forest)

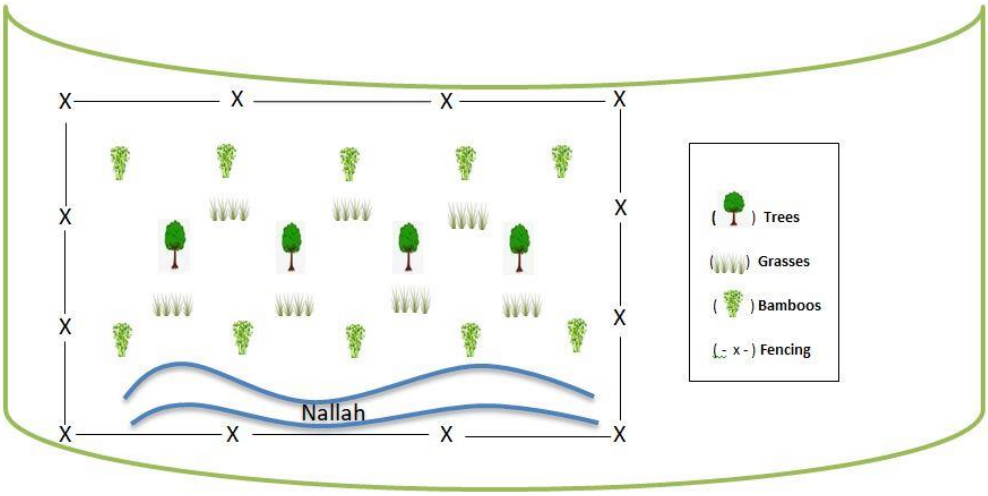


Fig. 1.25 - RV/HP/NL/09 – Eradication of *Lantana* (> 50%)

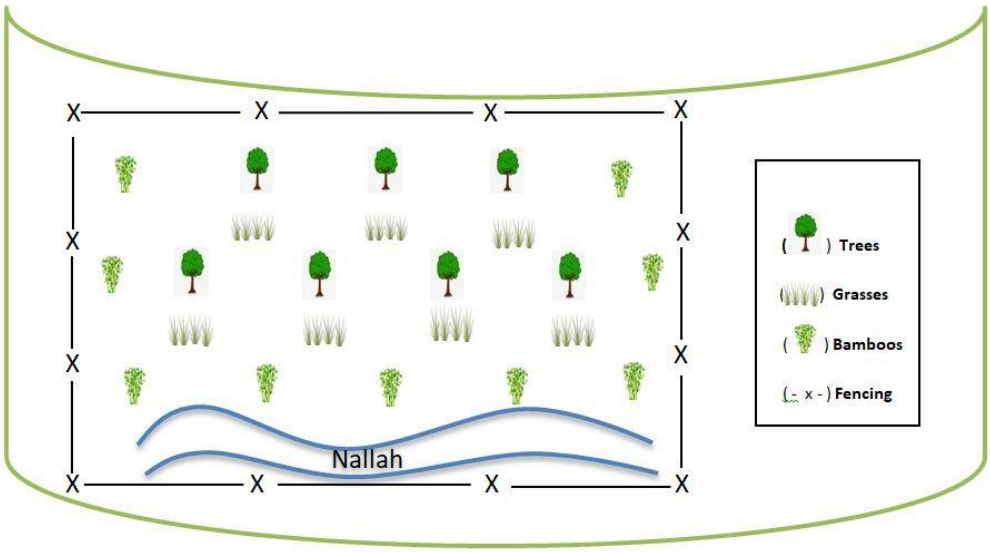


Fig. 1.26 - RV/HP/NL/10 – Control/ Removal of Invasive Species or <50% *Lantana*

Table 1.21 - Cost Norms of RV/HP/NL/01 (Alpine Conservation)

Year	Item	Detail of work	Amount (Rs)/ ha	Tentative Man days
	Number of Plants (No.)	2400 herbs, 600 patch of Grasses.		
1st Year	Advance Work Labour Cost	Establishment of Nursery.	12,000	48
2nd year		Maintenance of Nursery+ Establishment of Ist year maintenance.	10,200	38

	Advance Work Labour Cost	Site Preparation, site preparation i/c survey & demarcation , Bush Cutting in strips , collection of debris , burning of debris, preparation inspection path, Carriage of RCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire.	54,910	205
	Advance Work Material	Cost of Seed, Farm yard manure (FYM), Barbed wire and Reinforced Cement Concrete (RCC) poles/ Angle Iron Pole.	55,600	0
3rd year	Advance Work Labour Cost	Maintenance of Nursery for creation and maintenance work 1st and 2nd year.	9,000	31
	Creation	Carriage of plants, Lay out of pits and patches, Pitting & planting of plants, Patches & Planting of herbs, Preparation of strips including (i/c) sowing in strips, Weeding and mulching, etc.	25,087	88
Total Establishment Cost =				**410**
MAINTENANCE				
4th year	Maintenance Cost - I Year i/c Material	Nursery maintenance, Material cost, planting cost & other maintenance works.	22,517	68
5th year	Maintenance Cost - II Year	Nursery maintenance, Material cost, planting cost & other maintenance works.	17,515	49
6th year	Maintenance Cost - III Year	Nursery maintenance, Material cost, planting cost & other maintenance works.	13,199	35
7th year	Maintenance Cost - IV Year	Maintenance cost of fencing.	582	2
Total Maintenance Cost =			**53,813**	**154**
Total cost of Plantation =			**2,20,610**	**564**

Table 1.22 - Cost Norms of RV/HP/NL/02 (Sub Alpine Enrichment)

Year	Item	Detail of works	Amount (Rs)/ ha	Tentative Man days
	Number of Plants (No.)	Trees: 200, Herbs- 800.		
1st Year	N-Advance Work Labour Cost	Establishment of Nursery.	400	2
2nd year	N-Advance Work Labour Cost	Establishment of Ist year maintenance of plant.	3,746	14
3rd year	N-Advance Work Labour Cost	Maintenance of Nursery of herbs+ Ist and IInd year maintenance of plant nursery.	10,650	37

4th year	A-Advance Work Labour Cost	Nursery 1st of herbs+ 1st, 2nd and 3rd year maintenance of trees nursery.	17,787	12
		Site Preparation, Site preparation i/c survey & demarcation , Bush Cutting in strips, collection of debris , burning of debris, preparation inspection path, Carriage of fence RCC pole and RCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire.	62,867	205
	Advance Work Material	Cost of Seeds, Farm Yard Manure (FYM), Barbed wire and Reinforced Cement Concrete (RCC) poles/ Angle Iron Pole/ Angle Iron Pole.	55,000	0
5th year	Advance Work Labour Cost	Maintenance of Nursery for creation and maintenance works 1st and 2nd year.	12,805	39
	Creation	Carriage of plants, Lay out of pits and patches, Pitting & Planting of plants, Patches & Planting of herbs, Preparation of strips including (i/c) sowing in strips, Weeding and mulching.	7,659	23
Total Establishment Cost (Rs.) =			**1,70,914**	**332**
MAINTENANCE				
6th year	Maintenance Cost - I Year i/c Material	Nursery maintenance, Material cost, planting cost & other maintenance works.	13,793	35
7th year	Maintenance Cost - II Year	Nursery maintenance, Material cost, planting cost & other maintenance works.	8,993	20
8th year	Maintenance Cost - III Year	Nursery maintenance, Material cost, planting cost & other maintenance works.	3,305	6
Total Maintenance Cost (Rs.) =			**26,091**	**61**
Total cost of Plantation =			**1,97,005**	**393**

Table 1.23 - Cost Norms of RV/HP/NL/03 (Temperate Conifer Forest)

Year	Item	Detail of work	Amount/ ha (Rs)	Tentative Man days
	Number of Plants (No.)	Plants- 300 No., Bamboo-200, Shrubs-300 no., Herbs- 1200 no (300 no. patches).		
1st Year	Advance Work Labour Cost	Establishment of Nursery.	10,000	40
2nd year		Maintenance, of Nursery+ Establishment of Ist year maintenance.	38,879	145

	Advance Work Labour Cost	Site Preparation- Site Preparation i/c survey & demarcation , Bush Cutting in strips, Collection of debris, Burning of debris, Preparation inspection path, Carriage of RCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire.	54,910	205
	Advance Work Material	Cost of Seed, Farm Yard Manure (FYM), Barbed wire and Reinforced Cement Concrete (RCC) poles/ Angle Iron Pole/ Angle Iron Pole.	52,000	0
3rd year	Advance Work Labour Cost	Maintenance of Nursery for creation and maintenance works 1st and 2nd year.	28,603	100
	Creation	Carriage of plants, Lay out of pits and patches, Pitting & Planting of plants, Patches & Planting of herbs, Preparation of strips including (i/c) sowing in strips, Weeding and mulching.	45,157	158
Total Establishment Cost (Rs.) =			**2,29,549**	**648**
MAINTENANCE				
4th year	Maintenance Cost - I Year i/c Material	Nursery maintenance, Material cost, planting cost & other maintenance works.	37,034	118
5th year	Maintenance Cost - II Year	Nursery maintenance, Material cost, planting cost & other maintenance works.	20,711	61
6th year	Maintenance Cost - III Year	Nursery maintenance, Material cost, planting cost & other maintenance works.	16,107	44
7th year	Maintenance Cost - IV Year	Maintenance cost of fencing.	582	2
Total Maintenance Cost (Rs.)=			**74,434**	**225**
Total cost of Plantation =			**3,03,983**	**873**

Table 1.24 - Cost Norms of RV/HP/NL/04 (Temperate Mixed Forest)

Year	Item	Detail of works	Amount/ ha (Rs)	Tentative Man days
	Number of Plants (No.)	Plants- 300 No., Bamboo-200, Shrubs-300 no., Herbs- 1200 no (300 no. patches).		

1st Year	Advance Work Labour Cost	Establishment of Nursery.	14,491	58
2nd year	Advance Work Labour Cost	Maintenance of Nursery+ Establishment of Ist year maintenance.	33,045	124
		Site Preparation- Site Preparation i/c survey & demarcation, Bush Cutting in strips, Collection of debris , Burning of debris, Preparation inspection path, Carriage of fence RCC pole and RCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire.	54,910	205
	Advance Work Material	Cost of Seed, Farm yard manure (FYM), Barbed wire and Reinforced Cement Concrete (RCC) poles/ Angle Iron Pole/ Angle Iron Pole.	52,000	0
3rd year	Advance Work Labour Cost	Maintenance of Nursery for creation and maintenance works 1st and 2nd year	28,925	101
	Creation	Carriage of plants, Lay out of pits and patches, Pitting & Planting of plants, Patches & Planting of herbs, Preparation of strips including (i/c) sowing in strips, Weeding and mulching.	45,157	158
Total Establishment Cost (Rs.) =			**2,28,528**	**646**
MAINTENANCE				
4th year	Maintenance Cost - I Year i/c Material	Nursery maintenance, Material cost, planting cost & other maintenance works.	38,815	117
5th year	Maintenance Cost - II Year	Nursery maintenance, Material cost, planting cost & other maintenance works.	20,711	61
6th year	Maintenance Cost - III Year	Nursery maintenance, Material cost, planting cost & other maintenance works.	16,107	44
7th year	Maintenance Cost - IV Year	Maintenance cost of fencing.	582	2
Total Maintenance Cost (Rs.) =			**76,215**	**224**
Total cost of Plantation =			**3,04,743**	**870**

Table 1.25 - Cost Norms of RV/HP/NL/05 (Pasture and Grazing Land Development)

Year	Item	Detail of works	Amount/ha (Rs)	Tentative Man days
	Number of Plants (No.)	Grasses-2000 no. patches.		
1st Year	Advance Work Material	Cost of Seeds, Farm Yard Manure (FYM), Barbed wire and Reinforced Cement Concrete (RCC) poles/ Angle Iron Pole/ Angle Iron Pole.	66,400	0
	Advance Work Labour Cost	Site Preparation- Site Preparation i/c survey & demarcation, Bush Cutting in strips, Collection of debris, Burning of debris, Preparation of inspection path, Carriage of RCC Poles and RCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire.	54,910	205
2nd year	Creation	Carriage of plants, Lay out of pits and patches, Pitting & Planting of plants, Patches & Planting of herbs, Preparation of strips including (i/c) sowing in strips, Weeding and mulching.	40,850	143
Total Establishment Cost (Rs.) =			**1,62,160**	**348**
MAINTENANCE				
3rd year	Maintenance Cost - I Year i/c Material	Material cost, planting cost & other maintenance work.	27,994	67
4th year	Maintenance Cost - II Year	Material cost, planting cost & other maintenance works.	20,711	61
5th year	Maintenance Cost - III Year	Material cost, planting cost & other maintenance works.	16,107	44
6th year	Maintenance Cost - IV Year	Maintenance cost of fencing.	582	2
Total Maintenance Cost (Rs.) =			**65,394**	**174**
Total cost of Plantation =			**227554**	**522**

Table 1.26 - Cost Norms of RV/HP/NL/06 (Himalayan Chir Pine Forest)

Year	Item	Detail of works	Amount/ha (Rs.)	Tentative Man days
	Number of Plants (No.)	Plants- 300 No., Bamboo-100, Shrubs-300 no., Grasses- 800 no. patches.		
1st Year	Advance Work Labour Cost	Establishment of Nursery.	8,397	34

2nd year	Advance Work Labour Cost	Maintenance of Nursery+ Establishment of Ist year Maintenance.	11,861	44
		Site Preparation, Site preparation i/c survey & demarcation, Bush Cutting in strips, collection of debris, burning of debris, preparation of inspection path, Carriage of RCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire.	54,910	205
	Advance Work Material	Cost of Seed, Farm Yard Manure (FYM), Barbed wire and Reinforced Cement Concrete (RCC) poles/ Angle Iron Pole/ Angle Iron Pole.	58,000	0
3rd year	Advance Work Labour Cost	Maintenance of Nursery for creation and maintenance. Works 1st and 2nd year.	11,890	42
	Creation	Carriage of Plants, Lay out of pits and patches, Pitting & Planting of plants, Patches & Planting of herbs, Preparation of strips including (i/c) sowing in strips, Weeding and mulching.	52,006	182
Total Establishment Cost (Rs.) =			**1,97,064**	**507**
		MAINTENANCE		
4th year	Maintenance Cost - I Year i/c Material	Nursery maintenance, Material cost, planting cost & other maintenance works.	39,786	118
5th year	Maintenance Cost - II Year	Nursery maintenance, Material cost, planting cost & other maintenance works.	31,875	90
6th year	Maintenance Cost - III Year	Nursery maintenance, Material cost, planting cost & other maintenance works.	26,144	70
7th year	Maintenance Cost - IV Year	Maintenance cost of fencing.	8588	24
Total Maintenance Cost (Rs.) =			**106,393**	**302**
Total cost of Plantation =			**3,03,457**	**809**

Table 1.27 - Cost Norms of RV/HP/NL/07 (Himalayan Mixed Forest)

Year	Item	Detail of works	Amount/ha (Rs.)	Tentative Man days
	Number of Plants (No.)	Plants- 300 No., Shrubs-300 no., Grasses- 200 no. patches.		
1st Year	Advance Work Labour Cost	Establishment of Nursery.	8,397	34
2nd year		Maintenance of Nursery+ Establishment of Ist year maintenance.	11861	44

	Advance Work Labour Cost	Site Preparation- Site preparation i/c survey & demarcation, Bush Cutting in strips, Collection of debris, Burning of debris, Preparation of inspection path, Carriage of RCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire.	54,910	205
	Advance Work Material	Cost of Seeds, Farm Yard Manure (FYM), Barbed wire and Reinforced Cement Concrete (RCC) poles/ Angle Iron Pole/ Angle Iron Pole.	52,600	0
3rd year	Advance Work Labour Cost	Maintenance of Nursery for creation and maintenance works 1st and 2nd year.	11,890	42
	Creation	Carriage of plants, Lay out of pits and patches, Pitting & Planting of plants, Patches & Planting of herbs, Preparation of strips including (i/c) sowing in strips, Weeding and mulching.	39,849	139
Total Establishment Cost (Rs.) =			**1,79,507**	**464**
MAINTENANCE				
4th year	Maintenance Cost - I Year i/c Material	Nursery maintenance, Material cost, planting cost & other maintenance works.	34,284	108
5th year	Maintenance Cost - II Year	Nursery maintenance, Material cost, planting cost & other maintenance works.	27,652	81
6th year	Maintenance Cost - III Year	Nursery maintenance, Material cost, planting cost & other maintenance works.	22,920	63
7th year	Maintenance Cost - IV Year	Maintenance cost of fencing.	8,588	23
Total Maintenance Cost (Rs.) =			**93,444**	**275**
Total cost of Plantation =			**2272951**	**739**

Table 1.28 - Cost Norms of RV/HP/NL/08 (Sub-Tropical Dry Deciduous Forest)

Year	Item	Detail of works	Amount/ha (Rs.)	Tentative Man days
	Number of Plants (No.)	Plants- 300 No., Shrubs-300 no., Grasses-200 no. patches.		
1st Year	Advance Work Labour Cost	Establishment of Nursery.	7,940	32

2nd year	Advance Work Labour Cost	Maintenance of Nursery+ Establishment of Ist year maintenance.	11,657	44
	Advance Work Labour Cost	Site Preparation- Site preparation i/c survey & demarcation, Bush Cutting in strips, collection of debris , burning of debris, preparation inspection path, Carriage of RCC poles, Digging of holes and Fixing for poles, Stretching & fixing of Barbed wire.	54,910	205
	Advance Work Material	Cost of Seeds, Farm Yard Manure (FYM), Barbed wire and Reinforced Cement Concrete (RCC) poles/ Angle Iron Pole/ Angle Iron Pole.	52,600	0
3rd year	Advance Work Labour Cost	Maintenance of Nursery for creation and maintenance work 1st and 2nd year.	9,544	33
	Creation	Carriage of Plants, Lay out of pits and patches, Pitting & Planting of plants, Patches & Planting of herbs, Preparation of strips including (i/c) sowing in strips, Weeding and mulching.	39,849	139
Total Establishment Cost (Rs.) =			**1,76,500**	**453**
MAINTENANCE				
4th year	Maintenance Cost - I Year i/c Material	Nursery maintenance, Material cost, planting cost & other maintenance works.	33,563	105
5th year	Maintenance Cost - II Year	Nursery maintenance, Material cost, planting cost & other maintenance works.	27,154	80
6th year	Maintenance Cost - III Year	Nursery maintenance, Material cost, planting cost & other maintenance works.	22,521	62
7th year	Maintenance Cost - IV Year	Maintenance cost of fencing.	8,588	23
Total Maintenance Cost (Rs.) =			**91,826**	**270**
Total cost of Plantation =			**2,68,326**	**723**

Table 1.29 - Cost Norms of RV/HP/NL/09 (Eradication of Lantana (> 50%)

Year	Item	Detail of works	Amount/ ha (Rs)	Tentative Man days
	Number of Plants (No.)	Plants/ Bamboo- 600 No., Grasses- 600 no. patches.		
1st Year	Advance Work Labour Cost	Establishment of Nursery.	5,955	24
		Lantana by Cut Root Stock method and Cleaning of *Lantana* (sprouts) and seedlings, one times (100%) and @15% one cut in Ist year.	31501	126

2nd year	Advance Work Labour Cost	Maintenance of Nursery+ Establishment of Ist year maintenance.	8,743	33
		Site preparation includes *Lantana* by Cut Root Stock method and Cleaning of *Lantana* (sprouts) and seedlings 3 times a year @15% in 2nd year @ 15% of unit cost (estb.) preparation of inspection path, Carriage of RCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire.	62609	234
	Advance Work Material	Cost of Seeds, Farm Yard Manure (FYM), Barbed wire and Reinforced Cement Concrete (RCC) poles/ Angle Iron Pole.	55,600	0
3rd year	Advance Work Labour Cost	Maintenance of Nursery for creation and maintenance work 1st and 2nd year.	7,158	25
	Creation	Carriage of plants, Lay out of pits and patches, Pitting & Planting of plants, Patches & Planting of herbs, Preparation of strips including (i/c) sowing in strips, Weeding, mulching, *Lantana* by Cut Root Stock method and Cleaning of *Lantana* (sprouts) and seedlings in 2 times in 3rd year @ 15% of unit cost (establishment).	49258	172
Total Establishment Cost (Rs.) =			**220,824**	**614**
MAINTENANCE				
4th year	Maintenance Cost - I Year i/c Material	Nursery maintenance, Material cost, planting cost & other maintenance works, Clearing of Fire line along fencing, *Lantana* by Cut Root Stock method and Cleaning of *Lantana* (sprouts) and seedlings in 2 times in 4th year @ 15% of unit cost (establishment).	41842	128
5th year	Maintenance Cost - II Year	Nursery maintenance, Material cost, planting cost & other maintenance works and Clearing of Fire line along fencing.	26028	74
6th year	Maintenance Cost - III Year	Nursery maintenance, Material cost, planting cost & other maintenance works and Clearing of Fire line along fencing.	21812	59
7th year	Maintenance Cost - IV Year	Maintenance cost of fencing and Clearing of Fire line along fencing.	8588	23
Total Maintenance Cost (Rs.) =			**98270**	**284**
Total cost of Plantation (Rs.) =			**319,094**	**898**

Table 1.30 - Cost Norms of RV/HP/NL/10 (Eradication of Lantana (<50%)

Year	Item	Detail of works	Amount/ ha (Rs)	Tentative Man days
	Number of Plants (No.)	Plants/ Bamboo- 400 No., Grasses- 400 no. patches.		
1st Year		Establishment of Nursery.	3970	16

	Advance Work Labour Cost	*Lantana* by Cut Root Stock method and Cleaning of *Lantana* (sprouts) and seedlings, one times (100%) and @15% one cut in Ist year.	31501	126
2nd year	Advance Work Labour Cost	Maintenance of Nursery+ Establishment of Ist year maintenance.	5829	22
		Site preparation includes *Lantana* by Cut Root Stock method and Cleaning of lantana (sprouts) and seedlings 3 times a year @15% in 2nd year @ 15% of unit cost (estb.) preparation of inspection path, Carriage of RCC poles, Digging of holes and Fixing for poles and Stretching & fixing of Barbed wire.	62609	234
	Advance Work Material	Cost of Seed, Farm yard manure (FYM), Barbed wire and Reinforced Cement Concrete (RCC) poles/ Angle Iron Pole.	54400	0
3rd year	Advance Work Labour Cost	Maintenance of Nursery for creation and maintenance work 1st and 2nd year.	4772	17
	Creation	Carriage of Plants, Lay out of pits and patches, Pitting & Planting of plants, Patches & Planting of herbs, Preparation of strips including (i/c) sowing in strips, Weeding, mulching, *Lantana* by Cut Root Stock method and Cleaning of *Lantana*(sprouts) and seedlings in 2 times in 3rd year @ 15% of unit cost (Establishment).	49258	172
Total Establishment Cost (Rs.) =			**212339**	**587**
MAINTENANCE				
4th year	Maintenance Cost - I Year i/c Material	Nursery maintenance, Material cost, planting cost & other maintenance works, Clearing of Fire line along fencing, *Lantana* by Cut Root Stock method and Cleaning of *Lantana*(sprouts) and seedlings in 2 times in 4th year @ 15% of unit cost (estb.).	39675	123
5th year	Maintenance Cost - II Year	Nursery maintenance, Material cost, planting cost & other maintenance works, Clearing of Fire line along fencing.	25046	72
6th year	Maintenance Cost - III Year	Nursery maintenance, Material cost, planting cost & other maintenance works Clearing of Fire line along fencing.	21372	58
7th year	Maintenance Cost - IV Year	Maintenance cost of fencing and Clearing of Fire line along fencing.	8588	23
Total Maintenance Cost (Rs.) =			**94681**	**276**
Total cost of Plantation (Rs.) =			**307020**	**863**

Table 1.31 - Cost Norms of RV/HP/NL/11 Protection Model for Natural Regeneration

Year	Item	Detail of works	Amount/ha (Rs)	Tentative Man days
	Number of Plants (No.)	Seed Broadcasting - (2 kg for conifer and 15 kg for Broad leaved).		
1st Year	I-Advance Work Material	Cost of Seeds, Farm Yard Manure (FYM), Barbed wire and Reinforced Cement Concrete (RCC) poles/ Angle Iron Pole.	50,400	0
	II-Advance Work Labour Cost	Site Preparation - Site preparation i/c survey & demarcation, Debris collection and burning, Preparation inspection path, Carriage of RCC poles, Digging of holes and Fixing for poles and Stretching & fixing of Barbed wire.	55,207	221
2nd year	III-Creation	Cleaning and un-saleable thinning (non-commercial) in regeneration areas, Climber cutting in the forests/ plantation area, Broadcasting sowing in plantation/ Regeneration area, Preparation of fire lines 2.5 m wide, Pruning of established saplings in plantation/regeneration 1/3 portion and Burning/maintenance of lines 2.5 m around the fencing.	22,694	85
Total Establishment Cost (Rs.) =			**1,28,301**	**306**
MAINTENANCE				
3rd year	Maintenance Cost - I Year i/c Material	Cleaning and un-saleable thinning (non-commercial) in regeneration areas, Climber cutting in the forests/ plantation area (50%),Broadcasting sowing in Plantation/Regeneration area(50%), Pruning of established saplings in plantation/ regeneration 1/12 portion, and Burning/ maintenance of lines 2.5 m around the fencing (2 times).	15,389	50
4th year	Maintenance Cost - II Year	Cleaning and un-saleable thinning (non-commercial) in regeneration areas, Climber cutting in the forests/ plantation area (30%), Broadcasting sowing in Plantation/Regeneration area(30%), Pruning of established saplings in plantation/ regeneration 1/15 portion and Burning/maintenance of lines 2.5 m around the fencing (2 times).	14,216	44
5thyear	Maintenance	Cleaning and un-saleable thinning (non-	13,174	39

	Cost - III Year	commercial) in regeneration areas, Climber cutting in the forests/ plantation area (20%),Broadcasting sowing in Plantation/Regeneration area(20%), Pruning of established saplings in Plantation/ Regeneration 1/18 portion and Burning/maintenance of lines 2.5 m around the fencing (2 times).		
6th year	Maintenance Cost - IV Year	Cleaning and un-saleable thinning (non-commercial) in regeneration areas, Climber cutting in the forests/ plantation area (15%), Broadcasting sowing in Plantation/Regeneration area(15%) and Burning/maintenance of lines 2.5 m around the fencing (2 times).	8,146	23
Total Maintenance Cost (Rs.) =			**50,925**	**156**
Total Cost of Plantation (Rs.) =			**1,79,226**	**462**

Table 1.32 - Cost Norms of RV/HP/NL/12 Fire Protection Model

Year	Item	Detail of work	Amount /ha (Rs)	Tentative Man days
1st Year	Establishment Cost	Cleaning of Fire lines (2.5 m width), Control burning, Engagement of fire watchers, Constructions of Ponds/ water harvesting structures, Procurement of firefighting equipment's / Elide fire extinguishing balls and maintenance, Awareness campaign and Community awareness.	32,863	131
MAINTENANCE				
2nd year	Maintenance Cost - I Year i/c Material	Cleaning of Fire lines (2.5 m width), Control burning, Engagement of fire watchers, Procurement of firefighting equipment's / Elide fire extinguishing balls and maintenance, Awareness campaign and Community awareness.	24,462	91
3rd year	Maintenance Cost - II Year	Cleaning of Fire lines (2.5 m width), Control burning, Engagement of fire watchers, Procurement of firefighting equipment's / Elide fire extinguishing balls and maintenance, Awareness campaign and Community awareness.	24,265	85
4th year	Maintenance Cost - III Year	Cleaning of Fire lines (2.5 m width),Control burning, Engagement of fire watchers, Procurement of firefighting equipment's / Elide fire extinguishing balls and maintenance, Awareness campaign and Community awareness	23,922	78

5th year	Maintenance Cost - IV Year	Cleaning of Fire lines (2.5mt width),Control burning, Engagement of fire watchers, Procurement of firefighting equipment's / Elide fire extinguishing balls and maintenance, Awareness campaign and Community awareness.	23,411	71
Total Maintenance Cost (Rs.) =			**96,060**	**325**
Total cost of plantation (Rs.) =			**1,28,923**	**456**

1.4.2 Agriculture Landscapes

The tree cover outside recorded forest area, particularly on farm lands is of vital importance from ecological functions of agro-ecosystems (i.e., pollinators, soil and moisture conservation regime, carbon sequestration (CS), environmental amelioration, etc.). As per the strategies given in the foregoing description, 'Agriculture Landscapes' have been recognized as one of the zones in the Ravi River/Ravi Riverscape. Comprehensive afforestation/ plantations on private farm lands in Agriculture Landscapes have been proposed in DPR.

Farmers/ villagers do recognize significance of trees on farm/private lands and they come forward for availing saplings of economic and fruit trees for plantations not only to augment their income, but they also do recognize ecological merits of such plantations. The current DPR, therefore, also proposes plantation activities in Agriculture Landscapes by adopting six models (RV/HP/AL/01, RV/HP/AL/02, RV/PB/AL/01, RV/PB/AL/02, RV/JK/AL/01 and RV/JK/AL/02). NYKS, *Mahila Mandals* and other NGOs/CBOs may play an important role in awareness campaigns about Forestry interventions which have also been included in the DPR. It is widely assumed and accepted that farmers usually do not indulge in cutting of such economic and fruits tress except those are solely planted as agro-forestry plantations of fast growing species as they do recognize multiple values obtained from such tree plantations on farmlands. Moreover, incentives in the form of maintenance cost to be provided to the farmer at the rate of Rs. 70/-, Rs. 35/-, Rs. 35/- and Rs. 35/- per plant for first, second, third and fourth year, respectively will motivate them to protect and retain these planted tree species on their private land. The monetary aid proposed for the plantation will ensure sustainability of proposed plantations (maximum 150 trees/ ha) in agriculture landscapes and thus adding ecological benefits. Further, though the ownership of the plantation raised under the agriculture landscapes is vested with farmers but the felling, removal, and transportation of such plantation material are regulated under the framework of various acts and procedures, (e.g., State Felling and Transit Regulations, Land Preservation Act, etc.) and other relevant regulations enforced from time to time by the concerned States/UT.

The proposed agricultural models will be implemented in private farmlands and community/Panchayat lands in rural areas. Availability of land will be ascertained by local officials of State Forest Department based upon proposals from local farmers and communities. Plants will be supplied to farmers and local communities who will carry out planting.

Maintenance cost will be given to the land owners based upon plant survival at the end of first, second, third and fourth years. Nehru Yuva Kendra may play a pivotal role in facilitating coordination between State Forest Department and farmers/communities.

(A) Treatment Models for Agriculture Landscapes (AL) in Himachal Pradesh

Model No. – RV/HP/AL/01	**Boundary Plantation Model**
Zone	**Agriculture/Horticulture Land in Himachal Pradesh**

This model will be implemented in agricultural land in sub-tropical to temperate zones in Himachal Pradesh. The area is mostly hilly for most of this zone with moderate to steep slopes. The sites proposed for this model are agricultural or horticultural lands where off season vegetables and fruit crops are grown; hence, these sites possess better soil fertility and managerial care with occasional subsistence irrigation mostly available as water is judiciously divided among local communities collectively distributed by themselves only.

The farmers/ orchardists will decide the species and number of plants per unit area of economically important tree species (including hill bamboo) keeping in view their requirements; they may freely grow agricultural/horticultural crops of their own choice with the trees in any planting geometry. Mostly tree planting will be done on vacant areas around farms/ orchard and near settlements. Hill bamboo will be planted on boundaries, and will also act as live fencing for farm/ orchard in future. Quality planting material will be supplied to the local communities through HPSFD. Planting and maintenance of the plants will be done by farmers/ orchardists. Financial incentive to the growers will be provided keeping in view the performance of the plantation, especially survival. The local communities/ beneficiaries would be provided technical knowledge for the purpose through relevant institutes or universities, etc.

List of species for plantation

Tree: *Prunus armeniaca, Prunus cerasifera, Prunus domestica, Prunus persica, Myrica esculenta, Citrus limon, Diospyros lotus, Diospyros edulis, Diospyros kaki, Phyllanthus emblica, Terminalia chebula, Mangifera indica, Psidium guajava, Eriobotrya japonica, Terminalia bellirica, T. chebula*, etc.

Shrubs: *Drepanostachyum falcatum, Thamnocalamus spathiflorus, Berberis* spp., *Rubus* spp., *Zanthoxylum armatum, Justicia adhatoda , Vitex negundo*, etc.

Cost Sharing: The Government will share cost of planting material i.e., plant cost Rs. @ 70/- during the first year. In addition The Government would also provide Rs. @ 35/-, Rs. 35/-, Rs. 35/- for II to IV towards maintenance and maximum of 150 trees per ha. would be allowed. So cost comes out to be Rs.9,000 per hectare for Ist year while and for IInd, IIIrd and IVth year will be Rs. 4,500 per ha.

Table 1.33 - Cost Norms and Pattern of financial Assistance for Peripheral and Boundary Plantation (PBP) in Himachal Pradesh

Sr. No.	Type of Interventions	Indicative Unit Cost Per Plant (Rs.)
1	Pre-Plant activities/Land clearing/Maintenance, etc.	20
2	Digging /Planting, etc.	12
3	Single Unit Planting Material etc.	30
4	Transportation Charges	3
5	Critical Inputs *viz*., FYM, Fertilizer, Seed Treatment, Vesicular Arbuscular Mycorrhizae (VAM), etc.	20
6	Planting Cost	5
7	Fencing	20
8	Maintenance (Weeding+ Watering, etc.)	40
Total		**150**
Note: (i) The activity wise cost indicated above are tentative and States would have the flexibility to formulate their own estimates based on local requirements subject to a maximum of Rs. 150/- per plant. (ii) The assistance will be given on the basis of year-wise proportion in ratio of 40:20:20:20 during four-year of programme implementation.		

Model No. – RV /HP/AL/02	**Planting of Economic Trees in Block Plantation**
Zone	**Agriculture/ Horticulture Land in Himachal Pradesh**

This model will be implemented in Agricultural/ Horticultural land in sub-tropical to temperate zones in Himachal Pradesh. The area is hilly and the slope is moderate to gentle. The sites proposed for this model are agricultural/ horticultural/ grassland where grains, off season vegetables, stone fruit crops, grasses, etc. are grown. Hence, these sites possess better soil fertility and managerial care with occasional subsistence irrigation mostly available water judiciously divided among local communities collectively distributed by themselves only.

The zone experiences heavy rainfall during monsoon season and modest rainfall during winter months. Heavy rains during monsoon transport silt from these areas through number of seasonal water channels, *Nallahs*, rivulets, etc. to Ravi causing siltation and floods downstream. Besides this, agriculture, construction and developmental activities are the main reasons behind soil erosion from these areas. A large part of rainwater flows down the streams within a few hours of rainfall as surface run-off causing lot of soil erosion. The pressure for

grazing, fuel wood and tree fodder collection is considerable. Effective forestry interventions in this zone in agricultural/ horticultural/ grassland areas can help significantly in improvement of the flow of Ravi River and its tributaries.

For these areas, planting of economic trees in hills has been proposed for this zone. The farmers/ orchardists will decide the species and number of plants of per unit area of economically important tree species i.e., Harad (*Terminalia chebula*), Bahera *(Terminalia bellirica)*, Amla (*Phyllanthus emblica*), Reetha (*Sapindus mukorossi*), Chandan (*Santalum album*), etc. Block plantation in vacant and fallow land can be taken up by the farmers for increasing their income as well as utilising the fallow lands and other grasslands also.

List of species for plantation

Trees: *Prunus armeniaca*, *Prunus cerasifera*, *Prunus domestica, Prunus persica*, *Myrica esculenta*, *Diospyros lotus*, *Diospyros edulis*, *Diospyros kaki*, *Phyllanthus emblica*, *Terminalia chebula*, *Terminalia bellirica*, *Sapindus mukorossi*, etc.

Table 1.34 - Cost Norms and Pattern of Assistance for High Density Block Plantation (HDBP) in Himachal Pradesh

Sr. No.	Magnitude of Block Plantations (No. of Plants/Block of 1 ha)	Total Cost (Max.) (Rs.) for the Block ((or in proportion to planting intensity)			
		1- Year	2- year	3- Year	4-Year
1	500 to1000 (Spacing 3.5 m x3.5 m)	20,000	10,000	10,000	10,000
2	>1000 to1200 (Spacing 3mx3m)	24,000	12,000	12,000	12,000
3	>1200 to <1500 (Spacing 2.5 m x2.5 m)	30,000	15,000	15,000	15,000
4	≥1500 (Spacing less than 2.5 m x 2.5 m))	36,000	18,000	18,000	18,000

1.4.3 Urban Landscapes (UL)

(A) Treatment Models for Urban Landscapes (UL) in Himachal Pradesh

(i) Riverfront Development

Many cities, towns and semi-urban areas are located along the Ravi River and its tributaries. Urban and peri-urban area along the Ravi River may be developed to attract residents and visitors and offer them a grand sight of the river along with fresh air, mental peace, solace and spiritual fulfillment that would connect them with the river.

Riverfront development envisages riverbank plantation to stabilize it by protecting it from soil erosion. This involves covering the entire ground by intercepting the sunlight at various heights of canopy through multiple layers of vegetation. At the ground surface, the grasses or surface growers are allowed to cover and to bind the surface soil and control the surface soil erosion

like sheet erosion, splash erosion and rill erosion. It also promotes the rain water percolation and minimizes the surface runoff. At the second layer of vegetation, small to medium sized herbs and shrubs are accommodated to intercept some amount of sunlight and slow down the speed and reduce the erosive force of rain drops falling directly from sky and/or upper layers of canopy thereby reducing soil erosion (splash erosion). At the third layer of canopy above the ground surface, small to medium sized trees or larger shrubs are accommodated to provide a dense crown cover. This comprises light loving plants having good timber value and multipurpose benefits like fodder, fuel woods, etc. Scattered taller strong light demander trees may make one or two higher layers of canopy. Strong root binders are promoted on this type of site. Multi-tier planting methods are preferred. A basic support system may also be developed for the convenience of visitors.

The Riverfront of Ravi River and its tributaries have different owners: farmers, municipal corporations, irrigation department, institutions, forests department, etc. and substantial proportion is under private ownership. Suitable steps will be taken to ensure smooth coordination of the activities among different agencies/owners.

One model for riverfront development has been proposed. Site-specific activities will be carried out at different places commensurate with the local site conditions available for riverfront development. Description of the model is given below:

Model No. –RV/HP/ UL/01	**Riverfront Development**
Zone	**Along the Ravi River Course or Tributaries**

The proposed model of Riverfront development would involve plantation of avenue shrubs and trees along the riverbank to stabilize the soil and protect the bank from erosion. It would also have beds of annual flowering plants and patches of grasses. The area is so developed that would provide a pleasing and relaxing environment to the visitors. It would be a typical landscaping area comprised of vegetation and non-vegetation components.

According to requirements following components need to be created for riverfront development:

i. **Vegetation Part:** Grove consisting of shade trees, ornamental trees and bamboos, small herbal garden, climbers, hedges, grasses for lawn, etc.
ii. **Non-vegetation Part:** Stairs, pathways, walking trails, stone pitching, benches, rain shelters, e-public utilities, parking area, information centre, refreshment area, etc. as per the site specific requirements.

The vegetation and non-vegetation components will be arranged in such a way to enhance the aesthetic beauty of Riverfront. Ornamental species will be planted according to their recommended spacing and site specific suitability.

For using the available space economically and efficiently multi-tier planting methods will be used. Soil binding and water loving ornamental tree and shrub species are ideal choice for

riverbank planting. To bind the surface soil, grasses and surface growers will be allowed to cover the surface and protect soil from erosion especially during rainy season or river flooding. It will minimise soil loss through sheet erosion, splash erosion and rill erosion. It will also improve rain water per collation or absorption. Besides this, small to medium sized herbs and shrubs will be accommodated at the second layer of vegetation to intercept some amount of sunlight and stop the fast/ forceful falling of rain drops directly from sky in turn which stop soil erosion (splash erosion). Small to medium sized ornamental trees or larger shrubs i.e. mainly light demanding plants will be accommodated at the third layer of canopy to cover the crown area. This layer will provide small timber, fuel, fodder and intangible benefits. The top canopy will be occupied by the strong light demanding species which are ultimately the dominant species on riversides.

List of species for plantation
Trees: *Jacaranda mimosifolia*, *Grevillea robusta*, *Albizia* spp., *Butea monosperma*, *Dalbergia sissoo*, *Salix* spp., *Saraca asoca*, *Polyalthia longifolia*, *Callistemon viminalis*, *Thevetia peruviana*, etc.
Shrubs: *Bougainvillea* spp., *Rosa* spp., *Nerium indicum*, *Nyctanthes arbor-tristis*, *Spiraea* spp., *Euonymus* spp., etc.

(ii) Institutional and Industrial Estate Plantations

Number of Educational institutes, hospitals, government and private sector offices, factories, religious places, historical places, hotels, Guest Houses, etc. are located in the entire stretch on the banks of Ravi River and its tributaries. Many of such institutions and industries may have possibility to accommodate number of trees of different sizes for beautifying the overall landscape. Tree/shrub/climber plantations will be encouraged on such lands within the riverscape area. This would improve aesthetics; provide shade; produce non-wood and wood products; reduce air, noise and dust pollution; harbour birds; reduce erosion; and create awareness about importance of trees. Some of the trees may serve religious purpose too and could be developed as small sacred grooves with the approval of management of such institutions.

One model has been proposed for Institutional and Industrial Estate Plantation. Site-specific activities will be carried out according to the site conditions. Description of the model is given below.

Model No. – RV /HP/ UL/02	**Institution and Industrial Estate Plantation**
Zone	**Institutions and Industrial Estate**

In this model, mainly ornamental, shade and fruit plants will be encouraged for planting. Evergreen plants especially Silver oak (*Grevillea robusta*) will be preferred so that the leaves do not shed during winter months when air pollution is usually high in plains. Plantation of forest species will be raised near the vicinity of various institutions and industries at 3 m x 3m. Pit size of 45 cm x 45 cm x 45 cm will be used for plantation. Pit size of 45 cm x 45 cm x 45 cm will be used for plantation. After land development, pit digging, etc., plants mainly of broadleaved species such as *Syzygium venosum*, *Anthocephalus cadamba*, *Dalbergia sissoo*, *Melia* spp., *Pongamia pinnata*, *Holoptelea integrifolia*, *Azadirachta indica*, *Saraca asoca*, *Acacia nilotica*, etc. will be planted. The initiative will beautify the area, create awareness among people associated with institutions and industries and promote environmental services, besides providing economic returns from under-utilized land.

List of species for plantation

Trees: *Syzygium venosum*, *Anthocephalus cadamba*, *Dalbergia sissoo*, *Pongamia pinnata*, *Holoptelea integrifolia*, *Thuja orientalis*, *Cryptomeria japonica*, *Araucaria araucana*, *Acacia nilotica*, *Jacaranda mimosifolia*, *Grevillea robusta*, *Albizia chinensis*, *Albizia procera*, *Salix alba*, *Saraca asoca*, *Ficus rumphii*, *Polyalthia longifolia*, *Callistemon citrinus*, *Kigelia pinnata* and *Tamarindus indica.*

(iii) Eco-Park Development

Development of some sites of Urban Landscapes into Eco-Park is an important activity keeping in view the growing population and settlements in urban areas. Actually landscaping and beautification is proposed to be done for Urban and Peri-urban Landscapes of frequent public visitation so as to enhance aesthetics and entertainment coupled with nature awareness. The natural layout of the land will be maneuvered in such a way that the aesthetics will be enhanced without much investment by greening the blank areas. Landscape area will be designed to afford good soil, moisture and biodiversity conservation besides to improvement in aesthetic values.

One model has been proposed for Eco-Park development. Site-specific activities will be carried out at different places in harmony with the selected site conditions. Description of the model is given below.

Model No. – RV/HP/UL/03	**Eco-park Development**
Zone	**Proximity to Rivers and its Tributaries**

An Eco-Park will be better equipped than riverfront development to facilitate visitors. An Eco-Park will have both vegetation and non-vegetation components. Even in the Eco-Parks the proportion of ornamental plants will be relatively more than in the riverfront development model.

According to the requirement, the list of components to be created under this model is:

i. **Vegetation Part:** Miscellaneous ornamental plant species e.g., trees, shrubs, herbs, creepers, hanging plants, etc.

ii. **Non-vegetation Part:** Fencing, stairs, pathways, walking trails, stone pitching, rain shelter, e-public utilities, benches parking area, information centre, children playing area, pond beautification, landscaping, etc. as per site-specific requirements.

List of species for plantation

Tree: *Jacaranda mimosifolia, Grevillea robusta, Albizia chinensis, Albizia procera, Butea monosperma, Thuja orientalis, Cryptomeria japonica, Araucaria araucana, Kigelia pinnata, Dalbergia sissoo, Salix babylonica, Saraca asoca, Polyalthia longifolia, Callistemon citrinus, Syzygium venosum , Ficus rumphii*, etc.

Shrubs: *Bougainvillea* spp., *Rosa* spp., *Nerium indicum*, *Nyctanthes arbor-tristis*, *Spiraea* spp., etc.

Table 1.35 – Cost Norms for Treatment Models for Urban Landscape in Himachal Pradesh

Sr. No	Model No.	Amount Rs/Ha	Man days	Amount Rs/Ha	Man days	Amount Rs/Ha	Man days	Amount Rs/Ha	Man days
		Establishment		**1st year Maint.**		**2nd year Maint.**		**3rd year Maint.**	
1	RV/HP/UL/ 01 Riverfront Development	1,50,00,000	18000	45,00,000	5400	30,00,000	3600	22,50,000	2700
2	RV/HP/UL/02 Institution Plantation	2,60,000	312	78,000	94	52,000	62	39,000	47
3	RV/HP/UL /03 Eco-Park Development	1,50,00,000	18000	45,00,000	5400	30,00,000	3600	22,50,000	2700

1.4.4 Conservation Interventions

Three types of conservation interventions *viz*., (a) Soil and water conservation, (b) Riparian wildlife management, and (c) Wetland management are being proposed for implementation by two States, one Union Territory Level IAs. Proposed conservation interventions will be implemented at the State/UT and local field levels. Details of three type of conservation interventions proposed are presented below.

(A) Soil and Water Conservation Measures

The description on physical sub-environment provided earlier in the context of Ravi Riverscape has highlighted that the catchment of the river, particularly in the mountainous tract of Himachal Pradesh suffers on account of landslides, bank erosion, habitat loss, construction activities and other unsustainable human activities resulting into severe problem of soil erosion and sedimentation. Accordingly, bioengineering as well as mechanical measures are envisaged

for the purpose of soil and water conservation. Various models have been proposed for soil and water conservation in state which are given below in Table 1.36.

Table 1.36 - List of Models of Soil conservation Intervention in Himachal Pradesh

Soil Conservation Intervention	
Sr. No.	**Himachal Pradesh**
1.	RV/HP/CI/01- Brushwood Check Dam
2.	RV /HP/ CI/02- Dry Stone Check Dam
3.	RV /HP/ CI/03- Crate Wire Structure
4.	RV /HP/CI/04- Pond
5.	RV /HP/ CI/05- Silt Detention Structure
6.	RV /HP/CI/06- Wetland Management
7.	RV /HP/CI/07- Riverine and Riparian Wildlife Management
8.	RV /HP/CI/08- Moraine Management

Table 1.37 - Cost Norms of Treatment Models for Soil and Water Conservation Interventions in Himachal Pradesh

Sr. No.	**Model No.**	**Amount Rs/m^3**	**Tentative Mandays**
1	RV/HP/CI/01Brushwood Interventions	300	2
2	RV/HP /CI /02 Dry stone activities	1800	8
3	RV/HP /CI /03 Crate wire activities	4500	15
4	RV/HP /CI/04 Water Ponds	350	22
5	RV/HP /CI /05 Silt Detention Dam Type Activities	6000	14

Table 1.38 – Cost Norms of Treatment Models for Other Conservation Interventions in Himachal Pradesh

Sr. No	**Year**	**RV/HP/CI/06 Riverine and Riparian Management**		**RV/HP/CI/07 Wetland Management**	
		Amount Rs/ha	**Mandays**	**Amount Rs/ha**	**Tentative Mandays**
	1st year	3,20,000	512	2,80,000	448
	2nd year	2,80,000	448	2,50,000	400
	3rd year	1,90,000	304	1,60,000	256
	4th year	1,20,000	192	1,20,000	192
	5th year	90,000	144	90,000	144

1.4.5 Supporting Activities

In addition to the above stated proposed forestry interventions in three types of landscapes (Natural, Agriculture, and Urban) and three types of conservation interventions, execution of priority supporting activities is considered vital for the successful implementation of the present DPR and envisaged wide range of specific activities in the priority sites identified within the riverscape on the basis of geospatial analysis and inputs from the field. A list of supporting activities is given below (Table 1.39).

Table 1.39 - List of Supporting Activities in Himachal Pradesh

Supporting Activities	
Sr. No.	**Himachal Pradesh**
1.	RV/HP/SA/01- Policy Level Intervention
2.	RV/HP/SA/02- Strategic Adaptive Research and Development
3.	RV/HP/SA/03- Participatory Monitoring
4.	RV/HP/SA/04- Capacity Development
5.	RV/HP/SA/05- Awareness
6.	RV/HP/SA/06- Evaluation
7.	RV/HP/SA/07- Project Management

1.4.6 Project Budget

Implementation of Forestry Interventions in Himachal Pradesh accounts for Rs.259.61 Crores for all the components and Rs. 212.03 Crores for the three landscapes and SMC measures in establishment phase only and Rs. 246.88 Crores for Establishment and maintenance phase excluding establishment and maintence cost of supporting activities. Year-Wise Breakup of Extent and Cost Coverage of Proposed Forestry Interventions in Himachal Pradesh are described in tables 1.40 -1.59 and Division Wise modelwise/sitewise projected extent and cost tables of H.P. are encloses as annexures 7 (a) to 12(b). The component/activity wise budget allocation for Himachal Pradesh has been described in Table no.1.43.The budget provided for Plantations and Treatment Models in Three Categories of Landscapes (Natural Landscapes, Eco Task Force, Agriculture Landscapes, Urban Landscapes) is 123.22 Crores, Conservation Interventions is 79.25 Crores, Supporting Activities is 9.56 Crores and for DPR – Phase II (Maintenance phase) Including Scaling Up and Replication of Successful Models of Forestry Interventions is 47.56 Crores. The consent letters regarding availability of land in different landscapes for Himachal Pradesh has been enclosed as Annexure 41 in Vol. II.

Table 1.40 – Component/ Activity Wise Budget Allocation for Himachal Pradesh

Sr. No.	Component/ Activity	Amount (Rs. in Crore)
	Implementation of Forestry Interventions in Himachal Pradesh (A1+A2+C1+C3)	**246.88**
A.1	**Plantations and Treatment Models in Three Categories of Landscape**	**123.22**
A.1.1	Natural Landscapes	74.00
A.1.2	Eco Task Force	22.43
A.1.3	Agriculture Landscapes	0.76
A.1.4	Urban Landscapes	26.03
A.2	**Conservation Interventions**	**79.25**
A.2.1	Soil and Moisture Conservation	53.21
A.2.2	Riverine and Riparian Wildlife Management	21.48
A.2.3	Wetland Management (Natural and Artificial)	4.56
A.3	**Supporting Activities**	9.56
A.3.1	Policy Level Interventions	0.07
A.3.2	Research Activities	0.84
A.3.3	Capacity Development	3.02
A.3.4	Awareness	1.77
A.3.5	Participatory Monitoring	0.31
A.3.6	Cost of PMUs of Two State Level Implementing Agencies	3.33
A.3.7	Evaluation	0.20
A.3.8	Contingency and Miscellaneous Activities	0.02
A	**Implementation of Forestry Interventions in Himachal Pradesh (A1+A2+A3)**	**212.03**
B.	**Strengthening Knowledge Management and National Capacity for Forestry Interventions and Conservation of Riverscapes**	**0.00**
C.	**DPR – Phase II (Maintenance phase) Including Scaling Up and Replication of Successful Models of Forestry Interventions**	**47.57**
C.1	Maintenance Cost of A.1 and A.2 (Cost of Phase II)+ Establishment of Phase II ETF	34.29
C.2	Maintenance Cost of A.3	3.16
C.3	Scaling Up and Replication of Successful Models of Forestry Interventions (5% of A.1 & A.2)	10.12
D.	**National Coordination for Forestry Interventions and Riverscape Conservation**	**0.00**
Total Phase I (A+B+D)		**212.04**
Total Project Cost (Phase I+II) (A+B+C+D)		**259.61**

The Year-Wise Breakup of Extent Coverage of Proposed Forestry Interventions in Himachal Pradesh has been described in Table no.1.44.

Table 1.41 – Year-Wise Breakup of Extent Coverage of Proposed Forestry Interventions in

Himachal Pradesh

Year	Period	Plantation and Treatment Models				Conservation Intervention		
		Natural Landscape (ha) *	Eco Task Force (ha)	Agriculture Landscape (ha)	Urban Landscape (ha)	Soil and Moisture Conservation Measures (m^3)	Riverine and Riparian Wildlife Management (ha) **	Wetland Conservation (ha) **
A. Phase I (Implementation Phase)								
I	**Est.**	*645*	-	76	35	54985	10	30
II	**Est.**	*260*	200	79	43.4	69245.5	225	23
	Maint.	645	-	76	35	-	10	30
III	**Est.**	672	200	49	34.8	57873.5	-	-
	Maint.	905	200	155	78.4	-	235	53
IV	**Est.**	809	200	-	-	38731	-	-
	Maint.	1577	400	204	113.2	-	235	53
V	**Est.**	879	200	-	-	26995.5	-	-
	Maint.	2386	600	128	78.2	-	235	53
Total Phase I	**Est.**	3265	800	204	113.2	247830.5	235	53
	Maint.	2386	600	204	113.2		110	30
B. Phase II (Maintenance Phase)								
VI	**Est.**	-	200	-	-	-	-	-
	Maint.	2620	800	49	34.8	-	225	23
VII	**Est.**	-	-	-	-		-	-
	Maint.	2360	600	-	-	-	-	-
VIII	**Est.**	-	-	-	-	-	-	-
	Maint.	1688	600	-	-	-	-	-
IX	**Est.**	-	-	-	-	-	-	-
	Maint.	879	400	-	-	-		
X	**Est.**	-	-	-	-	-	-	-
	Maint.	-	200	-	-	-	-	-
Total Phase II	**Est.**	-	200	-	-	-	-	-
	Maint.	2620	800	49	34.8	-	225	23
Grand Total Phase I and Phase II	**Est.**	3265	1000	204	113.2	247830.5	235	53
	Maint.	3265	1000	204	113.2	-	235	53

**Natural landscape also includes area of fire protection and natural regeneration models of natural landscape;*
***Area is virtual, considered for calculation of budgetary provisions*
**Est.=Establishment; and **Maint.=Maintenance*

The Year-Wise Breakup of Cost for Proposed Forestry Interventions in Himachal Pradesh has been described in Table no. 1.42.

Table 1.42 - Year-Wise Breakup of Cost for Proposed Forestry Interventions in Himachal Pradesh

Year	Period	Plantation and Treatment Models				Conservation Intervention		
		Natural Landscape (Rs. in Lakhs)	Eco Task Force (Rs. In Lakhs)	Agriculture Landscape (Rs. in Lakhs)	Urban Landscape (Rs. in Lakhs)	Soil and Moisture Conservation Measures (Rs. in Lakhs)	Riverine and Riparian Wildlife Management (Rs. in Lakhs)	Wetland Conservation (Rs. in Lakhs)
A. Phase I (Implementation Phase)								
I	**Est.**	862.54	700.00	11.13	91.00	883.98	32.00	84.00
II	**Est.**	1349.86	60.00	10.62	761.40	1250.32	720.00	64.40
	Maint.	116.05	300.00	5.94	27.30	-	28.00	75.00
III	**Est.**	1722.34	66.00	7.92	798.00	1459.63	-	-
	Maint.	150.30	315.00	12.03	246.62	-	649.00	105.50
IV	**Est.**	1594.30	72.00	-	-	891.74	-	-
	Maint.	398.90	320.00	17.10	405.33	-	439.50	72.80
V	**Est.**	620.04	80.00	-	-	834.89	-	-
	Maint.	585.71	330.00	11.04	273.81	-	279.00	54.60
Total PhaseI	**Est.**	6149.08	978.00	29.67	1650.40	5320.56	752.00	148.40
	Maint.	1250.96	1265.00	46.11	953.06	-	1395.50	307.90
B. Phase II (Maintenance Phase)								
VI	**Est.**		90.00	-	-	-	-	-
	Maint.	664.78	340.00	4.86	119.70	-	202.50	20.70
VII	**Est.**		-	-	-	-	-	-
	Maint.	356.32	374.00	-	-	-	-	-
VIII	**Est.**		-	-	-	-	-	-
	Maint.	163.94	368.00	-	-	-	-	-
IX	**Est.**		-	-	-	-	-	-
	Maint.	11.52	358.00	-	-	-	-	-
X	**Est.**	-	-	-	-	-	-	-
	Maint.	-	354.00	-	-	-	-	-
Total Phase II	**Est.**		90.00	-	-		-	-
	Maint.	1196.56	1794.00	4.86	119.70	-	202.50	20.70
Grand Total PhaseI and Phase II	**Est.**	6149.08	1068.00	29.67	1650.40	5320.56	752.00	148.40
	Maint.	2447.52	3059.00	50.97	1072.76	-	1598.00	328.60

**Natural landscape includes cost of fire protection and natural regeneration models of natural landscape*
**Est.=Establishment; and Maint.=Maintenance*

The Division Wise Proposed Extent of Plantations in Natural Landscapes in Himachal Pradesh except for Protection of Forest Fire and Natural Regeneration in Himachal Pradesh has been described in Table no. 1.43(a).

Table 1.43 (a): Division Wise Proposed Extent of Plantations in Natural Landscapes in Himachal Pradesh except for Protection of Forest Fire and Natural Regeneration in Himachal Pradesh

Sr. No.	Division	Year							Phase I		Year						Grand Total	
		Phase I							Total (Extent in ha)		Phase II							
		(Extent in ha)									(Extent in ha)					Total (ha)	(ha)	(ha)
		I	II	III	IV		V				VI	VII	VIII	IX	X			
		Estb. (Nur-sery raising for 3rd year creation) *	Estb. (Nursery raising for 4th year Creation) *	Estb. (i/c creation for 1st year plantation)	Estb. (i/c creation for 2nd year plantation)	Maint. (Maint of plantation 3rd year maintenance	Establish ment (i/c creation for 3rd year planta-tion	Maint (Maint of plant-ation 3rd year and 4th year maint	Estb.	Maint.	Maint.	Maint.	Maint.	Maint.	Maint.	Maint.	Estb.	Maint.
1	**Bharmour**	26	0	26	0	26	0	26	26	26	26	26	0	0	0	26	26	26
2	**Chamba**	401	18	401	18	401	129	419	548	419	548	548	147	129	0	548	548	548
3	**Churah**	140	759	140	759	140	727	899	1626	899	1626	1626	1486	727	0	1626	1626	1626
4	**Dalhousie**	105	32	105	32	105	23	137	160	137	160	160	55	23	0	160	160	160
Total		**672**	**809**	**672**	**809**	**672**	**879**	**1481**	**2360**	**1481**	**2360**	**2360**	**1688**	**879**	**0**	**2360**	**2360**	**2360**

The area shown is virtually for calculation of Budget part. However actual creation of plantation work will start from 3rd year onwards.

The Division Wise Proposed Extent of Plantations in Natural Landscapes for Protection of Forest Fire and Natural Regeneration in Himachal Pradesh has been described in Table no. 1.43(a.1).

Table 1.43(a.1) – Division Wise Proposed Extent of Plantations in Natural Landscapes for Protection of Forest Fire and Natural Regeneration in Himachal Pradesh

Sr. No	Division	YEAR										
		Phase I (Extent of Area in ha)						Phase I		Phase II	Phase I &II	
		I	II		III	IV	V	Total		VI	Total Area ha	
		Estb	Estb	Maint	Maint	Maint	Maint	Estb	Maint	Total Maint	Estb	Maint
1	Bharmour	195	0	195	195	195	195	195	195	0	195	195
2	Chamba	260	0	260	260	260	260	260	260	0	260	260
3	Churah	30	260	30	290	290	290	290	290	260	290	290
4	Dalhousie	160	0	160	160	160	160	160	160	0	160	160
Total		**645**	**260**	**645**	**905**	**905**	**905**	**905**	**905**	**260**	**905**	**905**

***The area shown is virtually for calculation of Budget part. However actual creation of plantation work will start from 3rd year onwards.*
**Est.=Establishment; and Maint.=Maintenance*

The Division Wise Projected Cost of Plantations in Natural Landscapes in Himachal Pradesh except for Protection of Forest Fire and Natural Regeneration in Himachal Pradesh has been described in Table no. 1.43(b).

Table 1.43(b) – Division Wise Projected Cost of Plantations in Natural Landscapes in Himachal Pradesh except for Protection of Forest Fire and Natural Regeneration in Himachal Pradesh

Sr.No	Division	Year							Year								
		Phase I						Phase I	Phase II								
		(Rs.in Lakhs)						(Rs. in Lakhs)	(Rs. in Lakhs)						Grand Total		
		I	II	III	IV		V	Total	VI	VII	VIII	IX	X	Total	Rs. In lakhs		
		Establishment (Nursery raising for 3rd year creation)	Establishment(Advance work for 3rd year plantation and Nursery raising for 4th year Creation	Establishment (i/c creation cost for 3rd year, Advance cost of 4th year and nursery cost of 5th year plantation)	Establishment (i/c creation cost for 4th year, Advance cost of 5th year and nursery cost of 5th year plantation)	Maintenance (Maint cost of plantation 3rd year maint, maint cost of nursery	Establishment (i/c creation cost for 5th year	Maintenance (Maint. Cost of plantation 3rd year and 4th year maint, maint cost of nursery	Establishment	Maintenance	Maintenance	Maintenance	Maintenance	Maintenance	Maintenance	Establishment	Maintenance	Total Cost
1	Bharmour	5.60	34.79	19.20	0	9.77	0	5.38.0	59.60	15.16	4.19	0.15	0	0	-	4.34	59.60	19.50	79.10
2	Chamba	132.47	461.64	339.48	160.98	155.25	87.82	105.03	1182.39	260.28	132.49	47.93	25.05	3.55	-	209.02	1182.39	469.3	1651.69
3	Churah	52.43	393.35	1263.48	1392.43	52.50	517.53	317.18	3619.21	369.68	462.49	284.36	130.13	5.99	-	882.98	3619.21	1252.66	4871.86
4	Dalhousie	21.07	126.50	100.18	40.89	39.57	14.70	43.09	303.32	82.67	44.43	23.88	8.76	1.98	-	79.05	303.32	161.72	465.04
Total		**211.56**	**1016.28**	**1722.34**	**1594.30**	**257.09**	**620.05**	**470.68**	**5164.52**	**727.77**	**643.60**	**356.32**	**163.94**	**11.52**	**-**	**1175.38**	**5164.52**	**1902.77**	**7067.68**

The Division Wise Projected Cost of Plantations in Natural Landscapes for Protection of Forest Fire and Natural Regeneration in Himachal Pradesh has been described in Table no. 1.43 (b.1).

Table 1.43 (b.1) – Division Wise Projected Cost of Plantations in Natural Landscapes for Protection of Forest Fire and Natural Regeneration in Himachal Pradesh

Sr. No	Division	YEAR											
		Phase I ((Rs.in Lakhs))						Phase I		Phase II	Phase I &II		
		I	II		III	IV	V	Total (Rs. in Lakhs)		VI	Total Cost (Rs. in Lakhs)		
		Estb	Estb	Maint	Maint	Maint	Maint	Estb	Maint	Total Maint	Estb	Maint	Total
1	Bharmour	235.87	0	31.37	29.23	27.3	18.18	235.87	106.08	0	235.87	106.08	341.95
2	Chamba	295.41	0	43.64	40.99	38.55	27.29	295.41	150.47	0	295.41	150.47	445.88
3	Churah	9.86	333.58	7.34	47.29	44.14	41.27	343.44	140.04	21.18	343.44	161.22	504.66
4	Dalhousie	109.84	0	33.7	32.79	31.82	28.29	109.84	126.6	0	109.84	126.6	236.44
Total		**650.98**	**333.58**	**116.05**	**150.3**	**141.81**	**115.03**	**984.56**	**523.19**	**21.18**	**984.56**	**544.37**	**1528.93**

**Est.=Establishment; and Maint.=Maintenance*

The Division Wise Proposed Extent of Plantations in Agriculture Landscapes in Himachal Pradesh has been described in Table no. 1.44**.**

Table 1.44 – Division Wise Proposed Extent of Plantations in Agriculture Landscapes in Himachal Pradesh

*Note: **Area of Agriculture Landscapes is virtual, considered for budgetary provisions*

**Est.=Establishment; and Maint.=Maintenance*

Sr. No	Division	Phase I: Year Wise Area (ha)							Phase I Total Area (ha)		Phase II: Area (ha)	Total Area Phase II (ha)	Grand Total Area (ha)	
		I	II		III		IV	V			VI			
		Estb	Estb	Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint
1	Bharmour	13	22	13.00	18	35	53	40	53	53	18	18	53	53
2	Chamba	22	18	22.00	2	40	42	20	42	42	2	2	42	42
3	Churah	23	17	23.00	12	40	52	29	52	52	12	12	52	52
4	Dalhousie	18	22	18.00	17	40	57	39	57	57	17	17	57	57
Total		**76**	**79**	**76**	**49**	**155**	**204**	**128**	**204**	**204**	**49**	**49**	**204**	**204**

The Division Wise Projected Cost of Plantations in Agriculture Landscapes in Himachal Pradesh has been described in Table no. 1.45.

Table 1.45 – Division Wise Projected Cost of Plantations in Agriculture Landscapes in Himachal Pradesh

Sr. No	Division	Phase I: Year Wise Cost (Rs in Lakhs)							Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
		I	II		III		IV	V			VI Year				
		Estb	Estb	Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	**Bharmour**	2.34	2.76	1.25	2.79	2.81	4.50	3.28	7.89	11.84	1.71	1.71	7.89	13.55	21.44
2	**Chamba**	2.76	2.79	1.47	0.96	3.08	3.79	2.26	6.51	10.6	0.59	0.59	6.51	11.19	17.7
3	**Churah**	3.24	2.31	1.73	1.86	3.08	4.29	2.49	7.41	11.59	1.14	1.14	7.41	12.73	20.14
4	**Dalhousie**	2.79	2.76	1.49	2.31	3.06	4.52	3.01	7.86	12.08	1.42	1.42	7.86	13.5	21.36
Total		**11.13**	**10.62**	**5.94**	**7.92**	**12.03**	**17.1**	**11.04**	**29.67**	**46.11**	**4.86**	**4.86**	**29.67**	**50.97**	**80.64**

**Est.=Establishment; and Maint.=Maintenance*

The Division Wise Proposed Extent of Plantations in Urban Landscapes in Himachal Pradesh has been described in Table no. 1.46.

Table 1.46 – Division Wise Proposed Extent of Plantations in Urban Landscapes in Himachal Pradesh

Sr. No	Division	YEAR											Grand Total Area (ha)	
		Phase I (Extent of Area in ha)							Phase I		Phase II			
		I	II		III		IV	V	Total		VI	Total		
		Estb	Estb	Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Total	Estb.	Maint
1	Bharmour	9	7.5	9	5.5	16.5	22	13	22	22	5.5	5.5	22	22
2	Chamba	10	16.9	10	12.7	26.9	39.6	29.6	39.6	39.6	12.7	12.7	39.6	39.6
3	Churah	8	10	8	7.9	18	25.9	17.9	25.9	25.9	7.9	7.9	25.9	25.9
4	Dalhousie	8	9	8	8.7	17	25.7	17.7	25.7	25.7	8.7	8.7	25.7	25.7
Total		**35**	**43.4**	**35**	**34.8**	**78.4**	**113.2**	**78.2**	**113.2**	**113.2**	**34.8**	**34.8**	**113.2**	**113.2**

**Est.=Establishment; and Maint.=Maintenance*

The Division Wise Projected Cost of Plantations in Urban Landscapes in Himachal Pradesh has been described in Table no. 1.47.

Table 1.47 – Division Wise Projected Cost of Plantations in Urban Landscapes in Himachal Pradesh

Sr. No	Division	Phase I: Year Wise Cost (Rs in Lakhs)							Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
		I	II		III		IV	V			VI Year				
		Estb	Estb	Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Bharmour	23.40	240.60	7.02	88.00	76.86	78.03	53.69	352.00	215.60	13.20	13.20	352.00	228.80	580.80
2	Chamba	26.00	324.00	7.80	431.00	102.40	198.00	134.80	781.00	443.00	64.65	64.65	781.00	507.65	1288.65
3	Churah	20.80	26.00	6.24	153.20	11.96	54.28	34.54	200.00	107.02	22.98	22.98	200.00	130.00	330.00
4	Dalhousie	20.80	170.80	6.24	125.80	55.40	75.02	50.78	317.40	187.44	18.87	18.87	317.40	206.31	523.71
Total		**91.00**	**761.40**	**27.30**	**798.00**	**246.62**	**405.33**	**273.81**	**1650.40**	**953.06**	**119.70**	**119.70**	**1650.40**	**1072.76**	**2723.16**

**Est.=Establishment; and Maint.=Maintenance*

The Division Wise Proposed Extent for Soil and Moisture Conservation (Area in ha) in Himachal Pradesh has been described in Table no.1.48.

Table 1.48 – Division Wise Proposed Extent for Soil and Moisture Conservation (Area in ha) in Himachal Pradesh

Sr. No	Division	YEAR						Grand Total Area (ha)
		Phase I (Extent of Area in ha)					Phase I	
		I	II	III	IV	V	Total	
		Estb	Estb	Estb	Estb	Estb	Estb	Estb.
1	Bharmour	4273.5	3374.5	5250	1271	1000	15169	15169
2	Chamba	22314	28610.5	24135.5	18250.5	13988	107298.5	107298.5
3	Churah	22971	32549	24042	14431	8510	102503	102503
4	Dalhousie	5426.5	4711.5	4446	4778.5	3497.5	22860	22860
Total		**54985**	**69245.5**	**57873.5**	**38731**	**26995.5**	**247830.5**	**247830.5**

The Division Wise Projected Cost for Soil and Moisture Conservation (Rs. in Lakhs) in Himachal Pradesh has been described in Table no. 1.49.

Table 1.49 – Division Wise Projected Cost for Soil and Moisture Conservation (Rs. in Lakhs) in Himachal Pradesh

Sr. No	Division	Phase I: Year Wise Cost (Rs in Lakhs)					Total Phase I (Rs.in Lakhs)	Grand Total (Rs.in Lakhs)
		I	II	III	IV	V		
		Estb	Estb	Estb	Estb	Estb	Estb	
1	Bharmour	76.92	60.74	217.35	42.59	39.60	437.20	437.20
2	Chamba	340.00	530.9.	554.60	431.20	450.39	2307.09	2307.09
3	Churah	369.38	565.77	590.49	274.91	260.61	2061.16	2061.16
4	Dalhousie	97.68	92.91	97.19	143.04	84.29	515.11	515.11
Total		**883.98**	**1250.32**	**1459.63**	**891.74**	**834.89**	**5320.56**	**5320.56**

The Division Wise Proposed Extent (in ha) for Riverine and Riparian Wetland Management and Wildlife Conservation in Himachal Pradesh has been described in Table No. 1.50 .

Table 1.50 – Division Wise Proposed Extent (in ha) for Riverine and Riparian Wetland Management and Wildlife Conservation in Himachal Pradesh

Sr. No	Division	Phase I: Year Wise Extent of Area (ha)*						Phase I Total		Phase II Year Wise Extent of Area (ha)*		Grand Total (ha)	
		I	II		III	IV	V			VI	Total		
		Estb	Estb	Maint	Maint	Maint	Maint	Estb	Maint	Maint	Total	Estb	Maint
1	Chamba Wildlife Division	40	148	40.00	188	188	188	188	40	148	148	188	188
2	Hamirpur WL	0	100	0.00	100	100	100	100	100	100	100	100	100
Total		**40**	**248**	**40.00**	**288**	**288**	**288**	**288**	**140**	**248**	**248**	**288**	**288**

Note: ***Area of Riverine & Riparian Wildlife Management and Wetland Management is virtual, considered for budgetary provisions*

**Est.=Establishment; and Maint.=Maintenance*

The Division Wise Projected Cost (Rs. in Lakhs) for Riverine and Riparian Wetland Management and Wildlife Conservation in Himachal Pradesh has been described in Table no. 1.51.

Table 1.51 – Division Wise Projected Cost (Rs. in Lakhs) for Riverine and Riparian Wetland Management and Wildlife Conservation in Himachal Pradesh

Sr. No	Division	Phase I: Year Wise Cost (Rs in Lakhs)						Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
		I	II		III	IV	V			VI Year				
		Estb	Estb	Maint	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Chamba Wildlife Division	116.00	464.40	103.00	474.50	322.30	213.60	580.40	1113.40	133.20	133.20	580.40	1246.60	1827.00
2	Hamirpur WL	0	320.00	0	280.00	190.00	120.00	320.00	590.00	90.00	90.00	320.00	680.00	1000.00
Total		**116.00**	**784.40**	**103.00**	**754.50**	**512.30**	**333.60**	**900.40**	**1703.40**	**223.20**	**223.20**	**900.40**	**1926.60**	**2827.00**

The Year-Wise Projected Cost for Supporting Activities in Himachal Pradesh has been described in Table no. 1.52.

Table 1.52 – Year-Wise Projected Cost for Supporting Activities in Himachal Pradesh

Sr. No.	Activities	Year (Cost Rs. in lakh)												Grand Total (Cost Rs. in lakh) Phase I+II
		Phase I					Total Phase I	Phase II					Total Phase II	
		I	II	III	IV	V		VI	VII	VIII	IX	X		
1	**Policy Level Interventions**	1.53	1.19	1.25	1.31	1.38	**6.67**	0.72	0.00	0.00	0.00	0.00	0.72	**7.38**
2	**Research**	15.28	16.05	16.85	17.69	18.58	**84.45**	9.75	10.24	10.75	11.29	11.85	53.89	**138.34**
3	**Capacity Development**	61.00	53.55	66.23	59.04	61.99	**301.81**	0.00	0.00	0.00	0.00	0.00	0.00	**301.81**
4	**Awareness**	32.00	33.60	35.28	37.04	38.90	**176.82**	0.00	0.00	0.00	0.00	0.00	0.00	**176.82**
5	**Participatory Monitoring**	7.64	6.88	6.19	5.57	5.01	**31.29**	4.51	4.06	3.65	3.29	2.96	18.48	**49.77**
6	**Project Management Unit**	76.42	59.70	62.63	65.71	68.95	**333.41**	35.78	33.79	31.88	30.08	28.39	159.92	**493.33**
7	**Evaluation**	0.00	0.00	19.87	0.00	0.00	**19.87**	33.34	0.00	0.00	0.00	49.33	82.67	**102.55**
8	**Contingency and Miscellaneous Expenses**	0.38	0.30	0.31	0.33	0.34	**1.67**	0.18	0.17	0.16	0.15	0.14	0.80	**2.47**
Grand Total		**194.25**	**171.27**	**208.62**	**186.70**	**195.15**	**955.99**	**84.28**	**48.26**	**46.45**	**44.81**	**92.68**	**316.48**	**1272.47**

The Year-Wise Projected Cost of State Project Management Unit of Himachal Pradesh has been described in Table no. 1.53.

Table 1.53 – Year-Wise Projected Cost of State Project Management Unit of Himachal Pradesh

Sr. No.	Activities	Year (Cost Rs. in lakh)											Grand Total (Cost Rs. in lakh)
		Phase I					Total Phase I	Phase II				Total Phase II	
		I	II	III	IV	V		VI	VII	VIII	IX	X	
1	**Project Staff - Salary and Wages**	**47.76**	50.15	52.66	55.29	58.05	**263.90**	30.48	28.80	27.22	25.72	24.31	**136.52**	**400.43**
2	**Office Expenses**	**4.78**	0.50	0.53	0.55	0.58	**6.94**	0.30	0.29	0.27	0.26	0.24	**1.37**	**8.30**
3	**POL**	**4.78**	0.50	0.53	0.55	0.58	**6.94**	0.30	0.26	0.19	0.13	0.07	**0.96**	**7.89**
4	**Travel Expenses**	**4.78**	5.01	5.27	5.53	5.81	**26.39**	3.05	2.88	2.72	2.57	2.43	**13.65**	**40.04**
5	**Equipment – Office and Field**	**2.39**	0.02	0.02	0.02	0.02	**2.48**	0.02	0.02	0.02	0.02	0.02	**0.12**	**2.60**
6	**Purchase of Equipment - Computer, RS and GIS and IT**	**4.78**	0.96	0.96	0.96	0.96	**8.60**	0.05	0.05	0.05	0.05	0.05	**0.24**	**8.84**
7	**Furniture and Fixtures**	**4.78**	0.05	0.05	0.05	0.05	**4.97**	0.05	0.05	0.05	0.05	0.05	**0.24**	**5.21**
8	**Contingency and Miscellaneous**	**2.39**	2.51	2.63	2.76	2.90	**13.20**	1.52	1.44	1.36	1.29	1.22	**6.83**	**20.02**
Grand Total		76.42	59.70	62.63	65.71	68.95	**333.41**	35.78	33.79	31.88	30.08	28.39	**159.92**	**493.33**

The Projected Cost of Awareness Programme of Himachal Pradesh has been described in Table no. 1.54.

Table 1.54 – Projected Cost of Awareness Programme of Himachal Pradesh

Sr. No.	Activity	Phase I					Grand Total
		Year					(Cost Rs. in lakh)
		(Cost Rs. in lakh)					
		I	II	III	IV	V	
1	**Awareness Campaigns**	4.00	4.20	4.41	4.63	4.86	22.10
2	**Awareness Activities for General Public**	8.00	8.40	8.82	9.26	9.72	44.20
3	**Awareness Material – Pamphlets, Brochures, Booklets, Signages, Boards and Hoardings**	8.00	8.40	8.82	9.26	9.72	44.20
4	**Publicity Through Mass Media**	12.00	12.60	13.23	13.89	14.59	66.31
Grand Total =		**32.00**	**33.60**	**35.28**	**37.04**	**38.89**	**176.81**

The Projected Cost of Capacity Development at State and Division Level of Himachal Pradesh has been described in Table no. 1.55.

Table 1.55 – Projected Cost of Capacity Development at State and Division Level of Himachal Pradesh

Sr. No.	Activity	Norms Rs. in lakh	Phase I Year (Cost Rs. in lakh)					Grand Total (Cost Rs. in lakh)
			I	II	III	IV	V	
1	**Local Level Training for Communities (50 Trainings; 2-3 days)**	2.00	8.00	8.40	8.82	9.26	9.72	44.21
2	**Division Level Trainings for SFD Personnel, Line Departments and Other Partner Agencies (1 Training/ Division/ Year; 2-3 days)**	2.00	8.00	8.40	8.82	9.26	9.72	44.21
3	**State Level Inception Workshop (2-3 days)**	10.00	10.00	-	-	-	0	10.00
4	**State Level Seminar – Mid Term (2-3 days)**	10.00	0.00	0	10.00	0	0	10.00
5	**Exposure Trip Within State (30 participants; 2 per year)**	10.00	20.00	21.00	22.05	23.15	24.31	110.51
6	**Exposure Trip Outside State (15 participants; 1 per year)**	15.00	15.00	15.75	16.54	17.36	18.23	82.88
Grand Total			**61.00**	**53.55**	**66.23**	**59.04**	**61.99**	**301.81**

The Division Wise Details of Area/Extent and Cost for Three Different Landscapes and SMC Activities in Himachal Pradesh (Part-I) has been described in Table no. 1.56(a).

Table 1.56(a): Division Wise Details of Area/Extent and Cost for Three Different Landscapes and SMC Activities in Himachal Pradesh (Part-I)

Sr. No.	Division	Natural Landscape*				Agriculture Landscape				Urban Landscape			
		Total Area (ha)*	Cost (Rs. in Lakhs)		Total Cost (Rs. in Lakhs)	Total Area (ha)	Cost (Rs. in Lakhs)		Total Cost (Rs. in Lakhs)	Total Area (ha)	Cost (Rs. in Lakhs)		Total Cost (Rs. in Lakhs)
			Estb.	Maint.			Estb.	Maint.			Estb.	Maint.	
1	**Bharmour**	**221**	295.47	125.58	**421.05**	**53**	1.71	13.55	**21.44**	**22**	352.00	228.80	580.80
2	**Chamba**	**808**	1477.80	619.77	**2097.57**	**42**	0.59	11.19	**17.70**	**39.6**	781.00	507.65	1288.65
3	**Churah**	**1916**	3962.65	1413.88	**5376.52**	**52**	1.14	12.73	**20.14**	**25.9**	200.00	130.00	330.00
4	**Dalhousie**	**320**	413.16	288.32	**701.48**	**57**	1.42	13.50	**21.36**	**25.7**	317.40	206.31	523.71
Total		**3265**	**6149.08**	**2474.55**	**8596.61**	**204**	4.86	50.97	**80.64**	**113.2**	1650.40	1072.76	2723.16

**In Natural Landscape total area and total cost also include cost and area of fire protection and Natural Regeneration Models*

The Division Wise Details of Area/Extent and Cost for Three Different Landscapes and SMC Activities in Himachal Pradesh, (Part-II) has been described in Table no. Table 1.56(b).

Table 1.56(b): Division Wise Details of Area/Extent and Cost for Three Different Landscapes and SMC Activities in Himachal Pradesh, (Part-II)

Sr. No.	Division	Grand Total Area of Three Landscapes (ha)	Total Cost of Three Landscapes (Rs. in Lakhs)	SMC Measures		Grand Total Cost of Three Landscapes and SMC (Rs. in Lakhs)
				Total Extent (m^3)	Total Cost (Rs. in Lakhs)	
1	**Bharmour**	296	1023.29	15169	437.20	1460.49
2	**Chamba**	889.6	3403.92	107298.5	2307.09	5711.01
3	**Churah**	1993.9	5726.66	102503	2061.16	7787.82
4	**Dalhousie**	402.7	1246.55	22860	515.11	1761.66
Total		**3582.2**	**11400.42**	**247830.5**	**5320.56**	**16720.98**

The Division Wise Details of Area and Cost for Riverine & Riparian Wildlife Management and Wetland Management in Himachal Pradesh has been described in Table no. 1.57.

Table 1.57 - Division Wise Details of Area and Cost for Riverine & Riparian Wildlife Management and Wetland Management in Himachal Pradesh

Sr. No.	Divisions	Total Area (ha)**	Cost (Rs. in Lakhs		Grand Total Cost (Rs. in Lakhs
			Estb.	Maint.	
1	**Chamba Wildlife Division**	188	580.40	1246.60	1827.00
2	**Hamirpur WL**	100	320.00	680.00	1000.00
Total		**288**	**900.40**	**1926.6**	**2827.00**

***Area of Riverine & Riparian Wildlife Management and Wetland Management is virtual, considered for budgetary provisions*

Details of Area/Extent and Cost for Three Different Landscapes, SMC Activities and Riverine & Riparian Wildlife Management and Wetland Management in Himachal Pradesh have been described in Table no. 1.58.

Table 1.58 - Details of Area/Extent and Cost for Three Different Landscapes, SMC Activities and Riverine & Riparian Wildlife Management and Wetland Management in Himachal Pradesh

Sr. No.	Division	Grand Total Area of Three Landscapes (ha)	Total Cost of Three Landscapes (Rs. in Lakhs)	SMC Measures		Grand Total Cost of Three Landscapes and SMC (Rs. in Lakhs)	Riverine & Riparian Wildlife Management and Wetland Management		Grand Total Cost of Three Landscapes, SMC and Riverine and wetland Mgmt. (Rs. in Lakhs)
				Total Extent (m^3)	Total Cost (Rs. in Lakhs)		Total Extent	Total Cost (Rs. in Lakhs)	
1	**Bharmour**	296	1023.29	15169	437.20	1460.49	-	-	1460.49
2	**Chamba**	889.6	3403.92	107298.5	2307.09	5711.01	-	-	5711.01
3	**Churah**	1993.9	5726.66	102503	2061.16	7787.82	-	-	7787.82
4	**Dalhousie**	402.7	1246.55	22860	515.11	1761.66	-	-	1761.66
Total		**3582.2**	**11400.42**	**247830.5**	**5320.56**	**16720.98**		**-**	
5	**Chamba Wildlife Division**	-	-	-	-	-	188.00	1827.00	1827.00
6	**Hamirpur WL**	-	-		-	-	100.00	1000.00	1000.00
Total		**3582.2**	**11400.42**	**247830.5**	**5320.56**	**16720.98**	**288**	**2827**	**19547.98**

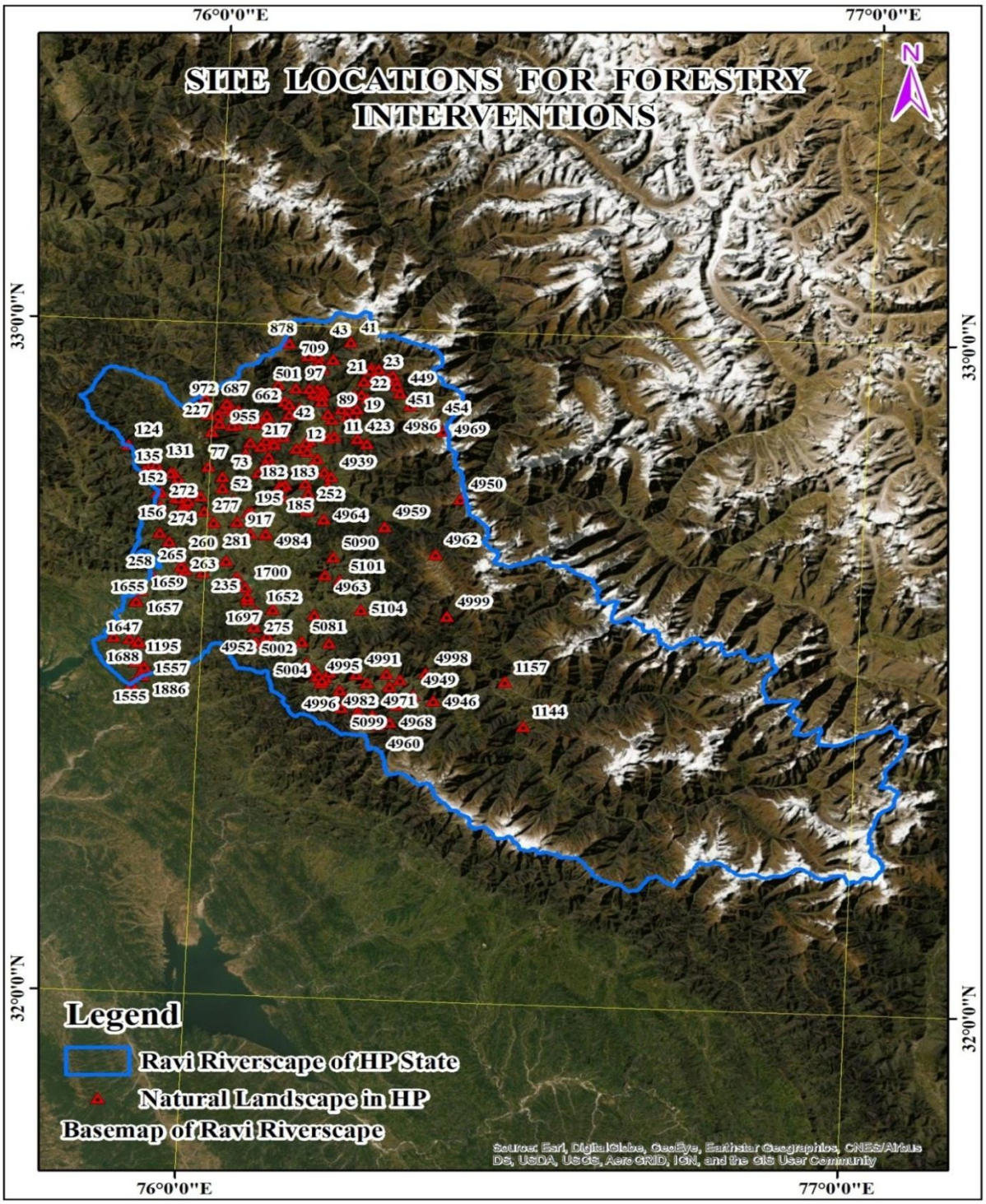
Details of Area/Extent and Cost for Three Different Landscapes, SMC Activities, Riverine, wetland and Eco Task Force in Himachal Pradesh have been described in Table no. 1.59.

Table 1.59 - Details of Area/Extent and Cost for Three Different Landscapes, SMC Activities, Riverine, wetland and Eco Task Force in Himachal Pradesh

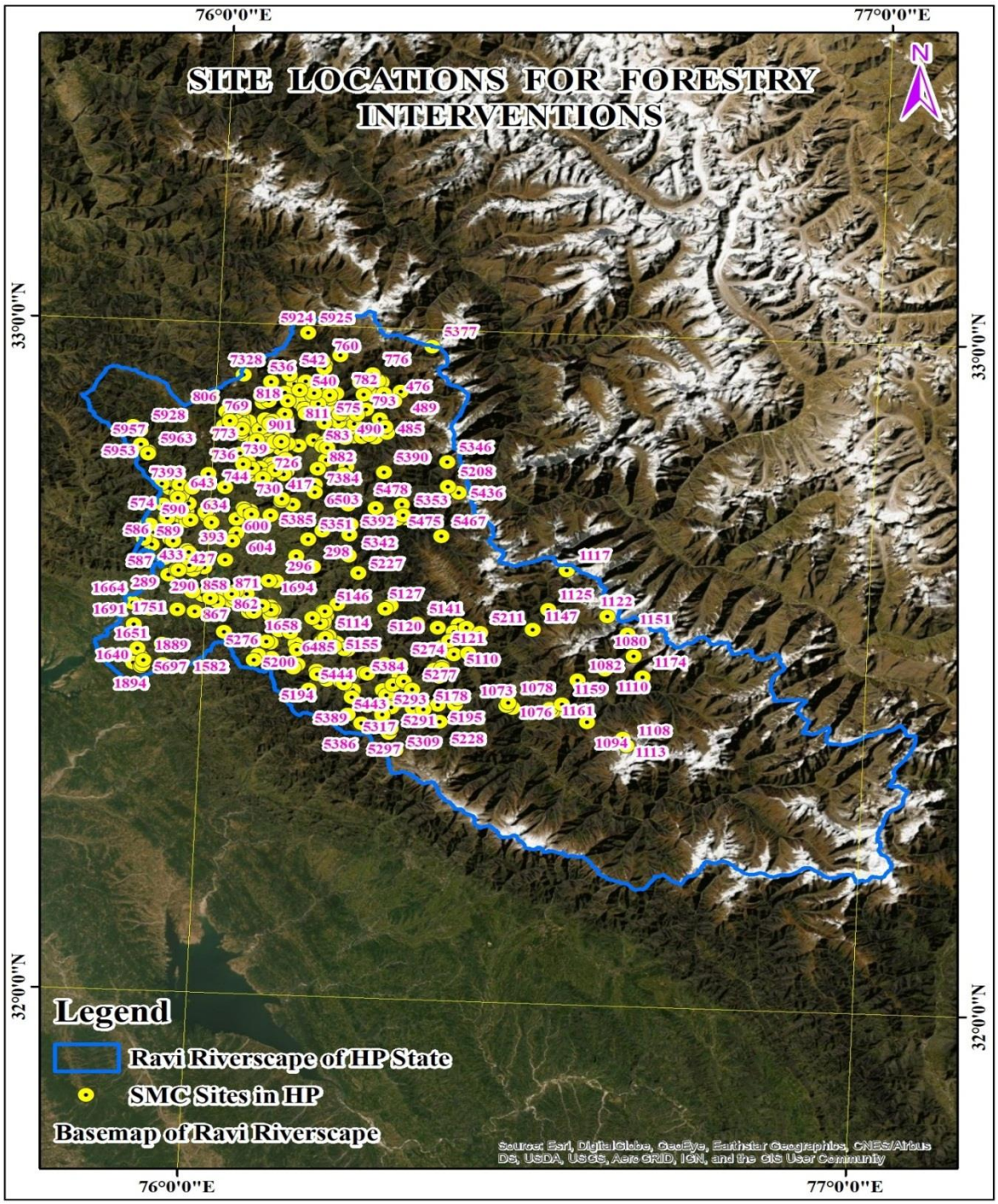
Sr No	Grand Total area of Three Landscapes (ha)	Grand Total cost of Three Landscapes (Rs. in Lakhs)	SMC Measures		Riverine and Wetland Management		ETF Measures		Grand Total Cost of Three Landscapes, SMC, Riverine and Wetland Management and ETF (Rs. in Lakhs)
			Total Extent (m^3)	Total Cost (Rs. in Lakhs)	Total Extent (ha)	Total Cost (Rs. in Lakhs)	Total Extent (ha)	Total Cost (Rs. in Lakhs)	
1	3582.2	11400.42	247830.5	5320.56	288	2827.00	1000	4127.00	23674.98
Total	**3582.2**	**11400.42**	247830.5	5320.56	**288**	**2827.00**	**1000**	**4127.00**	**23674.98**

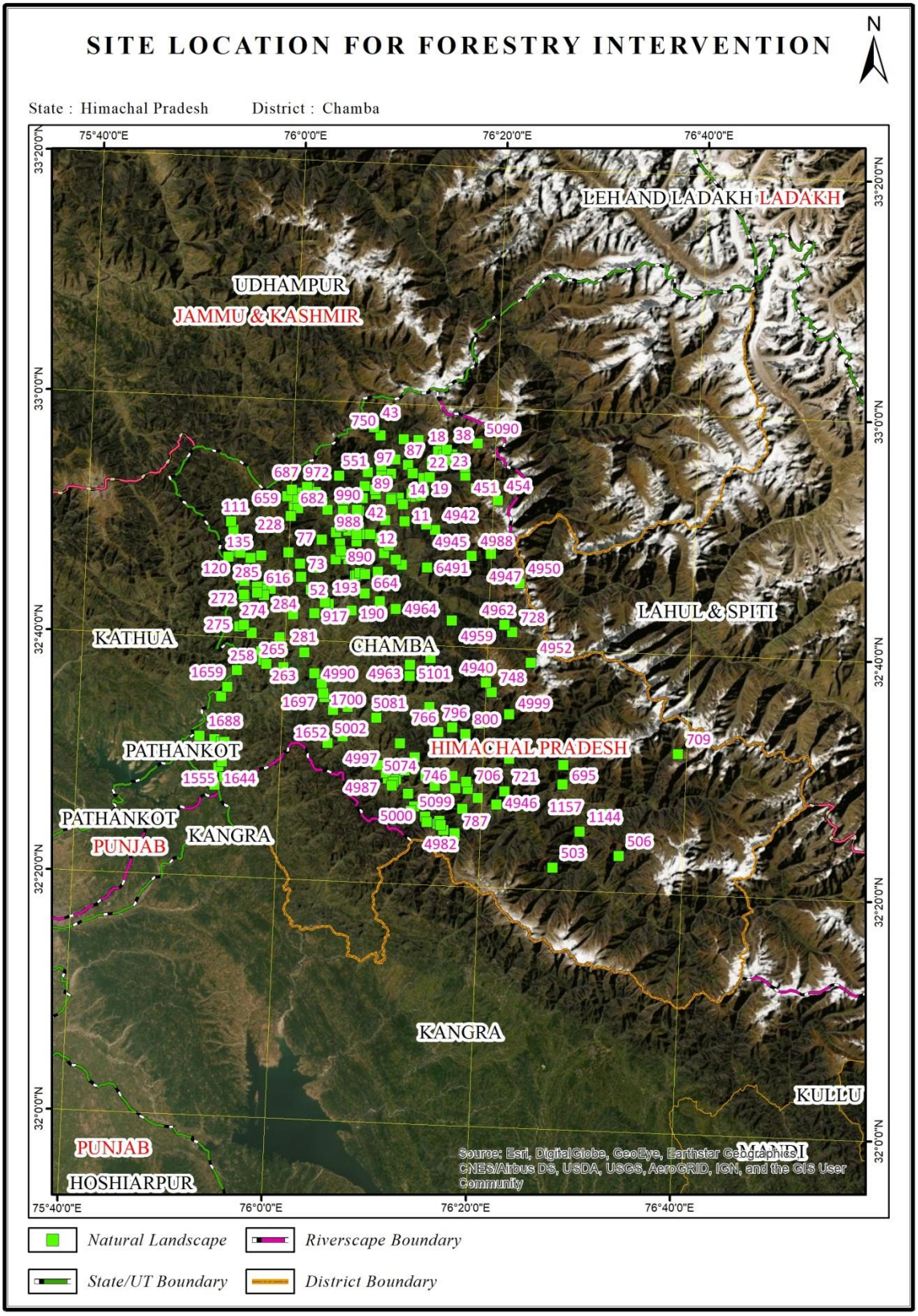
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Site Locations For Natural Landscape Forestry Intervention in Himachal Pradesh for Ravi River



Site Locations For Soil and Moisture Conservation Measures Forestry Intervention in Himachal Pradesh for Ravi River




SITE LOCATION FOR FORESTRY INTERVENTION
N
State : Himachal Pradesh
District : Chamba
75°40'0"E
76°0'0"E
76°20'0"E
76°40'0"E
33°20'0"N
33°0'0"N
32°40'0"N
32°20'0"N
32°0'0"N
LEH AND LADAKH
LADAKH
UDHAMPUR
JAMMU & KASHMIR
LAHUL & SPITI
KATHUA
CHAMBA
PATHANKOT
HIMACHAL PRADESH
PATHANKOT
PUNJAB
KANGRA
KANGRA
KULLU
PUNJAB
HOSHIARPUR
MANDI
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Natural Landscape
Riverscape Boundary
State/UT Boundary
District Boundary

JAMMU & KASHMIR, UT

2.1 Introduction

The Jammu and Kashmir Union Territory (J&K UT) was constituted through Jammu and Kashmir Reorganization Act, 2019, which was passed by both houses of the Parliament of India in August, 2019. The Act re-constituted the erstwhile State of Jammu and Kashmir into two Union territories viz. Jammu and Kashmir and Ladakh Union Territories, with effect from 31 October, 2019. The J&K UT is located at the northern most tip of the Indian Peninsula in the proximity of the Karakoram and Western Mountain ranges. The territory is separated by the line of control from Pakistan Occupied Kashmir (POK) and Gilgit-Baltistan in the west and north, respectively. To its south it borders with Himachal Pradesh and Punjab and to the west by Ladakh Union Territory. It shows conspicuous relief variation, snow-capped mountains, presumptive drainage, complex geological structure and also rich in temperate flora and fauna. Jammu and Kashmir UT is home to several valleys such as Kashmir Valley, Tawi Valley, Chenab Valley, Poonch Valley, Sind Valley and Lidder Valley. The J&K UT has 22 districts for administrative purpose (Fig.2.1). The J&K UT was named after two divisions/regions i.e., The Jammu Divsion and Kashmir Divsion. The Himalaya divides Kashmir Valley from the Tibetan Plateau, while Pir-Panjal Range which encloses the valley from the west and the south, separates it from Great Plains of northern India. Along the north eastern flank of the valley runs the main range of Himalaya.

The drainage systems of J&K UT are the Ladakh, Jhelum, Chenab, Ravi and Tawi Rivers. These rivers are perennial and fed by glaciers/snow melts and rainfall. It has many hill stations like Veinag, Kokranag, Srinagar, Gulmarg, Sonmarg, etc. The valley is famous for various springs of which Verinag (source of Jhelum), Martand (Anantnag), Achhabal (Anantnag), Kokernag (Ananatnag), Chashma Shahi (Famous for fresh water situated near Srinagar), Tullamulla or Khirbhawani (Sacred Spring), Vicharanag, Sukhnag, Vishnosar and Harmukat Ganga in Srinagar area and Chirnagand Vasaknag in Anantnag are also famous. Besides scenic beauty, J&K UT is also known as a famous pilgrimage center i.e., Shri Mata Vaishno Devi in Jammu province and Amarnath in Srinagar province. It attracts a large number of tourists round the year. The region is also famous for floriculture, agriculture, fruit, vegetables, saffron, herbs and also for its handicrafts like woolen carpets, shawls and embroidery cloths.



(Source: Bhuvan)

Fig 2.1 - The Jammu and Kashmir Union Territory

2.2 Jammu & Kashmir Union Territory Profile

2.2.1 Geographical Extent

The J&K UT covers a geographical area of 53,258 km^2 (ISFR, 2019) and extends between 33^0 21'54" to 34^{0}54'59" N Latitudes and 73^0 46'31" to 75^0 35'50" E Longitudes. It is surrounded by number of countries i.e., Pakistan in the west, Afghanistan in the northwest and China in the northeast. The Jammu region falls in Pir-Panjal Range, which is situated 2,000 m amsl. Kashmir region lies totally within the Himalaya surrounded by high hills of Pir-Panjal and Karakoram Ranges. The J&K UT with its summer and winter capitals at Srinagar and Jammu,

respectively consists of 22 districts i.e., 12 in Kashmir Valley and 10 in Jammu region. It has three geographical zones namely; (**i**) Sub-mountain and semi-mountain plains known as Kandi or dry belt; (**ii**) The Shivalik Ranges; and (**iii**) The high mountain zone constitute the Kashmir Valley, Pir-Panjal Range and its off-shoots including Doda, Poonch and Rajouri districts and parts of Kathua and Udhampur districts. The important Rivers are Jhelum, Chenab, Tawi, Ravi and Sheok. Besides these major Rivers, there are a few small rivers and streams running through the J&K UT. These Rivers facilitate irrigation to large part of the J&K UT.

2.2.2 Geology, Topography and Soil

(A) Geology

The J&K UT exhibits one of the magnificent developments of the stratigraphic succession right from the Archean to recent, holding a complete sequence of marine Paleozoics, Mesozoics and Cenozoics. Kashmir Valley composed of sedimentary, metamorphic and igneous rocks ranging in age from Precambrian to recent Geological Formations. The lacustrine sediments are spread in the central portion of the valley. A regional unconformity encompassing the period from the top of Silurian's to Middle Carboniferous is noteworthy in the north western part of Kashmir Valley. However, in the south eastern parts, a continuous Paleozoic record is found. Of the Mesozoics, the Triassics are best developed in the south eastern parts of Kashmir. Jammu region comprises Shivalik, Murrees and slates types of geological formations. The valley has protuberance of lacustrine *Karewas,* and is pierced by ravines. The important Karewas are found in Kulgam, Shopian, Budgam, Qazigund, Tangmarg, Gulmarg, Baramulla, Laithpora, Chandhara, Pampore, Bijbehara, Awantipora, Islamabad (Anantnag), Mattan, Tral and Ganderbal. The Karewas soils are composed of fine, silty clays with sand boulder gravel, the coarse detritus being as a rule, restricted to the peripheral parts of the valley, while the finer variety prevails towards the central parts (Farooq, 2016).

(B) Topography

The J&K UT is surrounded with lofty snow mountains, fascinating valleys, sparkling streams, dashing rivers and emerald forests. Within the south lies the Jammu region/division, the lower portion of that is actually hot in summer and cold in winters, bearing broad leafed forests at lower altitudes in plains and Shivaliks. The middle part of Jammu region largely supports Chirpine (*Pinus roxburghii*) forests whereas higher reaches are temperate and support luxuriant evergreen forests. The northwest region between Pir-Panjal and Zojila is Kashmir valley that is considered 'Paradise on Earth'. This fascinating valley attracts the guests and is a great repository of nature and scenic beauty. The J&K UT is blessed with diverse natural ecosystems. Topographically, the whole region is almost mountainous with two main ranges of Himalaya i.e., Karakoram and Pir-Panjal. Karakoram and Kyunlun Ranges lie to the north and northeast of the J&K UT and separate it from Russian, Turkistan and Tibet. Karakoram Range where K_2 Peak (8,611 m amsl), the second highest peak of the world is situated. Two lofty peaks of Gashorbram (8,570 m amsl) and Masharbram (7,827 m amsl) also lie in this range. There are many mountain peaks in Karakoram Range with height above 5,000 m amsl. Zanskar

Range separates the Indus Valley from Kashmir Valley. It is part of the Tethys Himalaya and is approximately 100 km wide. The Pir-Panjal Range lies to the south of the main Himalaya which has peak height about 4,100 m. It follows from Gulmarg in the northwest to southern rim of the Kashmir valley and Banihal Pass. Mountains have a geographical importance to climatic conditions of the J&K UT. The valley is gifted with rich flora and the most magnificent tree found in the valley is Chinar (*Platanus orientalis*). In addition Walnut (*Juglans regia*), Willow (*Salix* spp.), Almond (*Prunus dulcis*) and Cedar (*Cedrus deodara*) also add some richness to the flora of valley. Kashmir is also famous for its Apples (*Malus pumila*), Pears (*Pyrus* spp.), Peach (*Prunus persica*), Walnuts (*Juglans regia*), Almonds (*Prunus dulcis*) and Cherries (*Prunus* spp.). In addition, valley is also famous for production of high quality Saffron (*Crocus sativus*).

(C) Soils

The soils of J&K UT have been broadly classified into eight groups *viz.*,**(i) Brown earth/Brown forest soils:** These soils have been spotted in parts of Kathua, Udhampur, Doda, Poonch, Rajouri, Anantnag and Baramulla Districts; **(ii) Degraded or Grey brown podzolic soils:** These soils occur in parts of Baderwah, Ramnagar, Poonch, Gulmarg and Pahalgam; **(iii) Red and Yellow podzolic soils:** These soils occur in parts of Udhampur, Kathua, Rajouri and Poonch; **(iv) Hill or mountain forest soils:** These are sandy loam to loamy, fine to weakly granular moderately alkaline (pH 7.4 – 8.4) and calcareous (4% to 10% calcium carbonate) soils; **(v) Mountain meadow soils:** Sandy loam to clay loam fine to coarse granular mountain meadow soils occur in Gulmarg, Pahalgam, Sonmarg, Lolab, Gurez, and Changthang; **(vi) Lithosols:** Gravelly loam to gravelly silty loam, coarse to weak granular slightly alkaline (pH 7.1 – 7.8). Lithosols occur on steep slopes in the forest hills of 400 - 600 m amsl at Jammu, Udhampur, Kathua, Rajouri, and Poonch Districts; **(vii) Saline alkali soils:** These soils occur in alluvial belt of Jammu (RS Pura/Bishna) and Kathua (Ramkol/Challain) having EC more than 4 mmhos/cm at 25^{O}C, but their ESP is less than 15; and **(viii) Alluvial soils:** These soils cover plains of Kathua, Jammu, Rajouri, Poonch and Udhampur in Jammu and Vales in Kashmir. They are situated in the floodplains of Ravi, Chenab and Jhelum Rivers and their tributaries (Farooq, 2016).

2.2.3 Climate

The climate of J&K UT varies greatly owing to its rugged topography. It varies considerably with the altitude, and is mild in the lower elevations, but very cold in higher elevations. Two climatic zones have been experienced in the Jammu region of the J&K UT which depends primarily on altitude. Lower hills and plains has sub-tropical climate with hot dry summer lasting from April to July. Monsoon starts around middle of July and fading away in early September and this follows dry spell from September to November. Winter is mild and temperature seldom reaches freezing point. The winter in the valley is severely cold and temperature often goes below 0°C. Spring is pleasantly cold. Summers are warm and dry and autumn is again cool and sometimes wet. The Sub-Mediterranean climate of valley receives an

average rainfall of about 65 cm. Warmer weather starts in April and lasts till November with maximum temperature of 36 ºC and minimum of 14 ºC.

2.2.4 River System and Hydrology

(A) River System

Nature has blessed J&K UT with rich resources of lakes and rivers. The most important rivers include the Jhelum, Tawi, Chenab, Ravi and Kishenganga, which have their headwaters in the Himalayan Mountain Ranges and flow across the length of the territory (Fig. 2.2). All the rivers that originates from Himalaya receive almost 30-50% of annual flow from snow and glaciers melt run off. The unending water supply from these rivers forms the backbone in shaping the economy of the region. Main sectors of the J&K UT which are directly dependent on water resources include agriculture, horticulture, irrigation, hydro-electricity and tourism. Moreover, the water resources of the J&K UT are governed by special commandments laid down under the Indus Water Treaty (IWT, 1960). The rugged mountainous terrain, climate, and the human activities have made Jammu and Kashmir UT vulnerable to the vagaries of nature (Shukla and Ali, 2018). Three important main tributaries of Indus River Basin flowing through J&K UT are Chenab, Ravi and Jhelum Rivers. Jhelum River joins Chenab River little above Trimmu. Nearly 65 km below Trimmu, the Ravi River joins Chenab River. Chenab River makes junction with Sutlej River at Punjnad. About 65 km below Punjnad, it meets with Indus River at Mithankot.

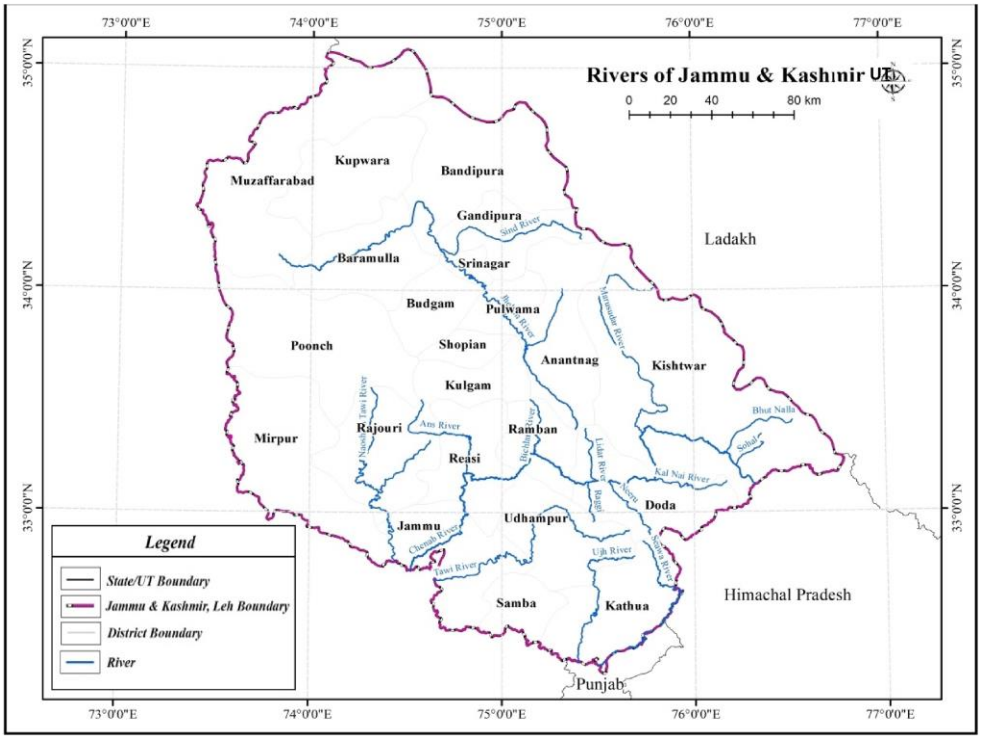


Fig 2.2 - Rivers of Jammu and Kashmir Union Territory

(A) Ravi River

The Ravi River is a trans-boundary river flowing through northwestern India and northeastern Pakistan. The Ravi River is one of the five tributaries of the Indus River in the Indian Territory. It is an integral part of the Indus River Basin and forms the headwater of the Indus River Basin. In Indian Territory, the River Basin lies in the States of Himachal Pradesh (HP), J&K UT and Punjab, and the River originates from Pir-Panjal Mountain Ranges in Bara Bhangal area of Kangra district. From Bara-Bhangal of Kangra district Himachal Pradesh, it flows through Bara Bansu, Tretha, Chanota and Ulhansa. The river drains a total catchment area of about 11,706.41 km^2 in India after flowing for a total length of 720 km, of which 320 km lie in India. It flows into the south-west near Dalhousie and then cuts a gorge in the Dhauladhar Range in Himachal Pradesh. The River enters Punjab near Pathankot and forms International boundary while passing through Gurdaspur and Amritsar districts of Punjab. The River has connection with the ancient sages. According to ancient history traced to Vedas, the Ravi River was known as Iravati. The major multipurpose project built on this river is Ranjit Sagar Dam at Thein village. The left bank of Ravi River is in Punjab and the right bank is in J&K UT. The major tributaries of Ravi River in J&K, UT are as follows.

Ujh River

The Ujh River is a tributary of the Ravi River that flows through the Kathua district of J&K UT. It originates from the Bhadarwah hills at an altitude of 4,300 m amsl in Jammu region. Ujh sub-basin terrain is hilly and rugged with altitude varying from 510 - 4,300 m amsl. After flowing for 100 km stretch, it joins Ravi at Nainkot in Pakistan. It flows along the Indo-Pak border for about 80 km, before entering Pakistan and joining the Chenab River.

Sewa River

The tributary of Ravi River originates from Sartha Hill Range and traverses through a short course of 53 km down to its confluence with Ravi River. The Sewa River in Basohli rises from the Domal Structure of Kali Kundi in the lap of Himalayan Ranges. The length of the River in the district is 125 km and the average width is about 250 m. The famous Sewa Hydel Project is being constructed on this river at village Sewa. The water of Sewa River is utilized for drinking and other purposes. The Sewa River feeds a number of small canals and *Kuhals* and its water is utilized for irrigation of agricultural lands of the district.

Basantar River

The Basantar River is fed by melting of snow in its upper reaches and in lower catchment, it is predominantly rainfed. The upper mountainous part of Basnatar River is narrow and elongated and broadened down along lower part, which has low hills and aggregational plains. The geology of the area consists of Shivalik system and is mainly composed of sandstone, silt, stone, red and purple transported quartzite. The lower reaches including the foothill plains consist of alluvial deposits brought down by seasonal rivulets.

Devak River

The Devak River, one of the tributaries of Ujh River, originates from Baral at an altitude of 850 m amsl.

(B) Hydrology

The most of the region is mountainous tract; precipitation in the lower region takes place in the form of rains while in the upper region in the form of snow. The hydrogeological regime of the J&K UT is complicated due to varied geological settings and ground water conditions. Two regions/divisions of J&K UT have different ground water regimes. Based on geology and aquifer characteristics, the area of the J&K UT can be divided into two broad hydrogeological units *viz.*, porous and fissured formations. In the outer plains of Jammu region which extends between Ravi River in the east to Munawar Tawi in the west, the ground water occurs in piedmont deposits belonging to upper Pleistocene to Recent age. In isolated valleys of middle Himalayas ground water occurs in valley fill deposits comprising of lacustrine to fluvio-glacial sediments. Ground water in the *Karewas* of Kashmir valley occurs under both confined as well as unconfined conditions. Fissured formations of Shivalik terrain tap groundwater either from the weathered mantle or from the joints or cracks of these rocks. Friable Shivalik sandstones do possess primary porosity but are not very potential aquifers (Pir, 2018). There have been significant changes in the land system particularly built-up in the floodplains of the Jhelum River. The large-scale urbanization of the Jhelum floodplains since the last 4-5 decades has adversely affected the hydrological functionality of the floodplains and increased the vulnerability of the people and infrastructure to floods.

Hydropower Projects on Jhelum, Chenab and Ravi River

As per Jammu and Kashmir State Power Development Corporation Limited, the combined estimated hydropower potential of Jammu and Kashmir and Ladakh Union Territories is 20,000 Megawatts (MW), of which about 16,475 MW have been identified. This comprises 11,283 MW in Chenab River Basin, 3,084 MW in Jhelum River Basin MW in Ravi River Basin and 1,608 MW in Indus River Basin. Out of the identified potential, only 3263.46 MW i.e., approximately 19.80 % has been exploited so far, consisting of 1,211.96 MW in State/UT Sector from 21 power projects, 2,009 MW in the Central Sector from 7 projects and 42.5 MW in Private Sector from 4 projects. There are 08 commissioned and about 25 proposed Hydro-electric Projects (HEPs) on Jhelum River in J&K. Uri-1 HEP (480 MW) is an important project on Jhelum River. Other commissioned HEPs include Lower Jhelum (105MW), Upper Sindh – II (105 MW), Upper Sindh- I (22.6 MW) and Ganderbal (15 MW) and remaining commissioned HEPs on Jhelum River are of <10 MW. Seven HEPs have been commissioned on Chenab River in J&K UT, important among these are Salal (690 MW), Baglihar (450 MW), Dulhasti (390 MW) and Chenani-I (23.30 MW). About 18 HEPs have been proposed on Chenab River in J&K. Ravi River flows through small stretch of J&K UT, 02 commissioned HEPs on river include Sewa-II (120 MW) and Sewa-III (9 MW), whereas, Ujh multipurpose project (280MW) is under construction (http://www.jkspdc.nic.in/).

2.2.5 Water Resources Issues

In order to foster India's economic and social prosperity, it is of paramount importance that enough freshwater is available to meet the requirements of agriculture, industries, and the domestic sector in the coming years. Widespread pollution of surface water and groundwater is degrading the quality of freshwater resources. The situation of plentiful water resources in the past is rapidly becoming one of water scarcity. The problems of pollution from municipal sewage, industrial effluents, agrochemicals, and pesticides have further threatened the availability of good quality water. In short, the country's fragile resources are stressed and depleting fast in both quality and quantity. Flood causes heavy loss to agriculture, livestock and property. Deforestation, overgrazing, mining, industrialization, global warming, etc. have contributed largely in the incidence of floods. India is facing frequent floods and droughts often at the same time in different parts because of variable nature and uneven distribution of rains. Besides these, due to large scale deforestation in the past and soil erosion, the rivers have been silted up causing floods. For sustained and increased agricultural production, industrial development and economic emancipation of the country the most vital resources are soil and water, which need to be conserved, developed and managed efficiently.

2.2.6 Forests and Vegetation

The total geographical area of J&K UT is 53,258km^2. The total forest cover of J&K UT is 21,122 km^2 which is 39.66% of the total geographical area. The J&K UT forests are divided into three categories namely very dense forest, moderately dense forest and open forest. In terms of forest canopy density classes, the UT has 4,202.66 km^2 under Very Dense Forest, 7,952.47 km^2 under Moderately Dense Forest and 8,967.27 km^2 under Open Forest. The scrub covered 249.56 km^2 area of UT. Forest cover of J&K Union Territory has been depicted in Table 2.1 and Fig. 2.3.

Table 2.1 - Forest in Jammu and Kashmir, UT

Union Territory	**Geographical Area (km^2)**	**2019 Assessment (Area in km^2)**				**Percent of Geographical area (km^2)**	**Change in Forest cover w.r.t. 2017 (km^2)**	**Scrub (km^2)**
		VDF	**MDF**	**OF**	**Total Forest**			
Jammu & Kashmir UT	53,258	4,202.86	7,952.47	8967.27	21,122.59	39.66	347.59	249.56

Source: FSI, 2019

VDF=Very Dense Forest; MDF=Moderate Dense Forest; OF=Open Forest

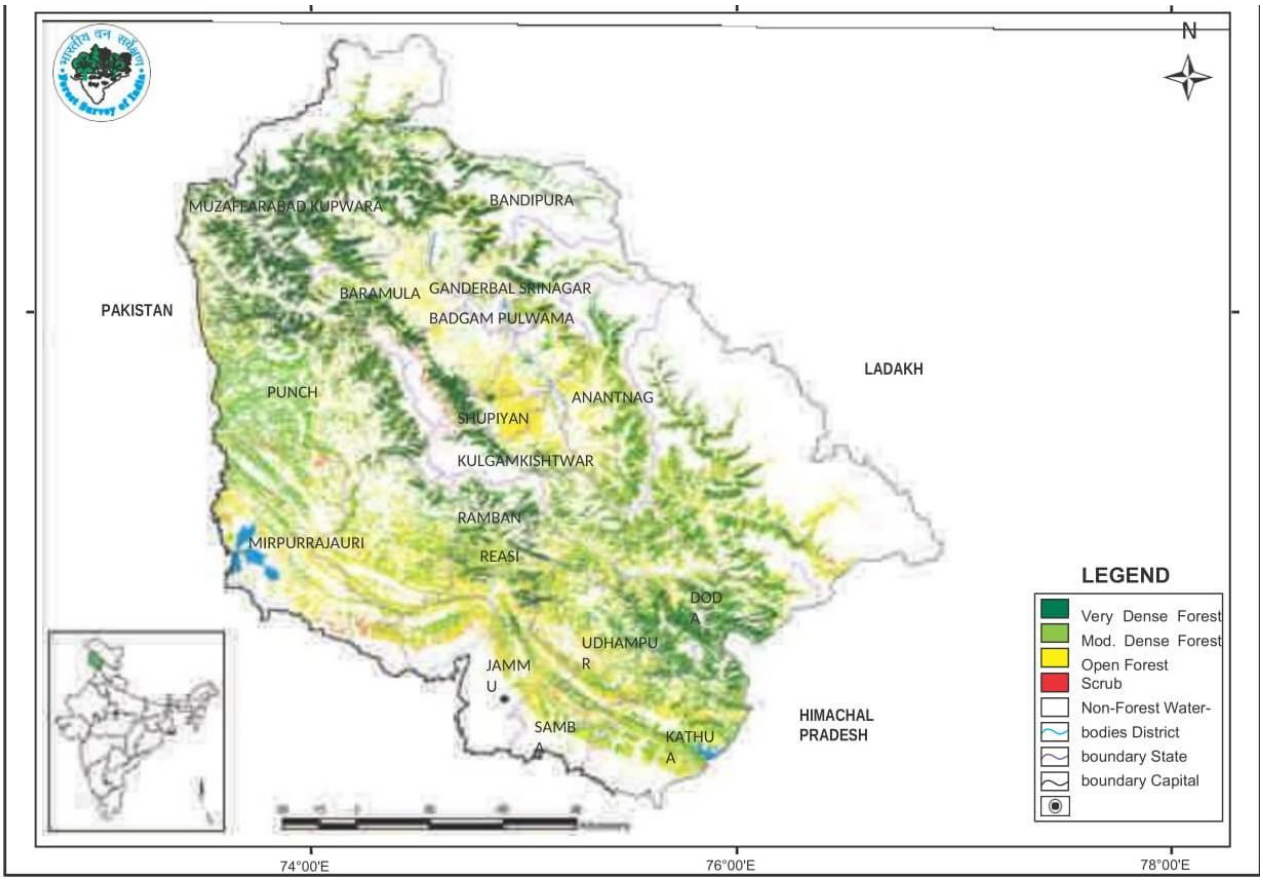


Fig 2.3 - Forest Cover of Jammu and Kashmir Union Territory

Forest Types - Forests of J&K UT belong to eight groups viz., Tropical Dry Deciduous, Sub-tropical Pine, Sub-tropical Dry Evergreen, Himalayan Moist Temperate, Himalayan Dry Temperate, Sub-Alpine Forest, Moist Alpine Scrub and Dry Alpine Scrub.

The vegetation of the J&K UT is broadly clubbed under following groups and forest types based largely on the altitude ranges and species composition (Table 2.2).

Table 2.2 - Forest Types of Jammu and Kashmir UT

Sr. No	Group	Forest Types	Altitude (m)	Dominant Species
1	Tropical Dry Deciduous Forests (Group-5)	1. Northern Dry Mixed Deciduous Forest	<750 m	*Anogeissus latifolia, Senegalia catechu*
		2. Dry Deciduous Scrub	< 750 m	*Senegalia catechu, Butea monosperma, Lannea coromandelica, Nyctanthes arbor-tristis, Dodonaea viscosa, Woodfordia fruticosa*
		3. Euphorbia Scrub	< 750 m	*Euphorbia royleana* and *Senegalia catechu, Acacia nilotica*

Sr. No	Group	Forest Types	Altitude (m)	Dominant Species
		4. Khair-Sissu Forest	<750 m	*Dalbergia sissoo, Senegalia catechu*
		5. Dry Bamboo Brake	< 750 m	*Dendrocalamus strictus*
2	Sub-tropical Pine Forests (Group-9)	1. Lower or Shivalik Chir Pine Forest	800-1,700 m	*Pinus roxburghii*
		2. Upper or Himalayan Chir Pine Forest	1,200-1,700 m	*Pinus roxburghii, Quercus incana, Rhododendron arboreum*
		3. Himalayan Subtropical Scrub	<1,000 m	*Carissa* spp., *Dodonaea viscosa, Rhus parviflora*
3	Sub-tropical Dry Evergreen Forests (Group 10)	1. *Olea cuspidata* Scrub Forests	<1,000 m	*Olea cuspidata, Punica granatum, Pistacia integerrima, Myrsine africana, Daphne oleiodes, Plectranthus* spp.
4	Himalayan Moist Temperate Forests (Group 12)	1. Ban Oak Forest	1,600-2,300 m	*Quercus oblongata, Rhododendron arboreum*
		2. Moru Oak Forest	1,200-2,250 m	*Quercus floribunda, Quercus oblongata, Cedrus deodara, Rhododendron arboreum*
		3. Moist Deodar Forest	1,700-3,500 m	*Cedrus deodara, Pinus wallichiana, Quercus floribunda, Quercus oblongata*
		4. Western Mixed Coniferous Forest	2,100-3,000 m	*Abies pindrow, Cedrus deodara, Picea smithiana, Pinus wallichiana, Quercus floribunda, Quercus oblongata*
		5. Moist Temperate Deciduous Forest	1,800-2,750 m	*Acer caesium, A. pictum, Betula alnoides, Ulmus wallichiana, Abies pindrow*
		6. Low-Level Blue Pine Forest	1,800-2,750 m	*Pinus wallichiana*
		7. Oak Scrub	1,200-2,750 m	*Pyrus pashia, Quercus floribunda, Quercus oblongata, Berberis* spp., *Prinsepia* spp.
		8. Himalayan Temperate Secondary Scrub	1,200-2,750 m	*Plectranthus rugosus, Berberis asiatica, Berberis lycium*
		9. Kharsu Oak Forest	2,700-3,500 m	*Quercus semecarpifolia, Picea smithiana, Pinus wallichiana, Rhododendron arboreum, Ilex dipyrena*
		10. West Himalayan Upper Oak/Fir Forest	2,600-3,000 m	*Abies pindrow, Pinus wallichiana, Quercus dilatata, Quercus floribunda, Quercus oblongata, Taxus wallichiana,*

Sr. No	Group	Forest Types	Altitude (m)	Dominant Species
				Betula alnoides, Acer spp.
		11. Alder Forest	>2,400 m	*Alnus nitida, Populus ciliata, Celtis australius*
		12. Riverine Blue Pine Forests	1,800-2,800 m	*Pinus wallichiana, Alnus* spp, *Populus* spp., *Cedrus deodara, Picea smithiana*
		13. Low Level Blue Pine Forests	1,000-3,000 m	*Pinus wallichiana, Quercus floribunda, Picea smithiana*
5	Himalayan Dry Temperate Forests (Group 13)	1. Dry Broadleaves and Coniferous Forest	2,000-2,400 m	*Cedrus deodara, Quercus ilex*
		2. Dry Deodar Forest	2,100-3,250 m	*Cedrus deodara, Pinus wallichiana, Picea smithiana*
		3. Pohu Scrub	1000-1800m	*Parrotia jacquemontiana*
		4. Dry Temperate Scrub		*Plectranthus rugosus, Berberis* spp., *Rosa* spp.
		5. West Himalayan Dry Temperate Deciduous Forest	2,900-3,600 m	*Acer caesium, A. pictum, Betula alnoides, Ulmus wallichiana*
		6. West Himalayan High- Level Dry Blue Pine Forest	3,000-3,600 m	*Pinus wallichiana, Pinus gerardiana, Abies spectabilis*
		7. *Populus*/*Salix* Forest	3,000-4,000 m	*Populus euphratica, Salix* spp.
6	Sub-alpine Forest (Group 14)	1. West Himalayan Sub-Alpine Fir Forest	2,900-3,050 m	*Abies spectabilis, Pinus wallichiana, Picea smithiana*
		2. West Himalayan Sub-Alpine Birch/Fir Forest	2,900-3,050 m	*Abies spectabilis, Betula utilis, Rhododendron* spp., *Quercus semecarpifolia*
		3. Sub Alpine Blue Pine Forests	2,900- 3300 m	*Pinus wallichiana*
7	Moist Alpine Scrub (Group 15)	1. Birch/*Rhododendron* Scrub Forest	> 3,500 m	*Betula utilis,Rhododendron* campanulatum, *R. anthopogon*
		2. Deciduous Alpine Scrub	> 3,350 m	*Betula utilis, Syringa emodi, Salix* spp., *Lonicera* spp., *Berberis* spp.
		3. Dwarf *Rhododendron* Scrub	3,350-4,600 m	*Rhododendron* campanulatum, *R. anthopogon*
		4. Dwarf Juniper Scrub	> 2,900 m	*Juniperus wallichiana, Juniperus communis*
8	Dry Alpine Scrub (Group 15)	1. Dry Alpine Scrub Forest	2,800-4,300 m	*Juniperus wallichiana, Juniperus communis*
		2. Dwarf Juniper Scrub	2,900-4,200 m	*Juniperus wallichiana, Juniperus communis*

(Source: FSI, 2011)

2.2.7 Agro-ecosystem

Agriculture and its allied activities are the predominant sector of the economy of Jammu and Kashmir Union Territory. Around 70% of the combined population of the two UTs resides in the rural areas and are directly or indirectly dependent upon the agriculture sector for their livelihood. The contribution of Agriculture sector towards Gross UT Domestic Product (GSDP) has remained constant which is indication of onset of declining trend of the sector. The combined production of three major crops paddy, maize and wheat in two UTs viz., J&K and Ladakh is > 90% of the total food grain production of all crops. The rest is shared by other cereals and pulses (Economic Survey, J&K, 2017). The Kashmir region is known for its horticulture industry. The industry plays a vital role in the UT's economic development. In 2016-17, total production of fruits in the UT stood at around 2.12 million metric tonnes. The combined Land use pattern of two UTs viz. J&K and Ladakh is given in Table 2.3 and Fig.2.4.

Table: 2.3 - Different Land Use Pattern in Jammu and Kashmir UT including Ladakh

Sr. No.	Land Use	Area (000 ha)	Percentage
1.	Total geographical area	22,224	NA
2.	Reporting area for land utilization	4,058	100.00
3.	Forests	2,299	53.50
4.	Not available for cultivation	571	15.47
5.	Permanent pastures and other grazing lands	113	3.39
6.	land under miscellaneous tree crops and groves	57	1.77
7.	Culturable wasteland	139	3.97
8.	Fallow lands other than current fallows	15	0.61
9.	Current fallows	106	1.72
10.	Net area sown	758	19.55

(Source: FSI, 2019; MoA, 2015).

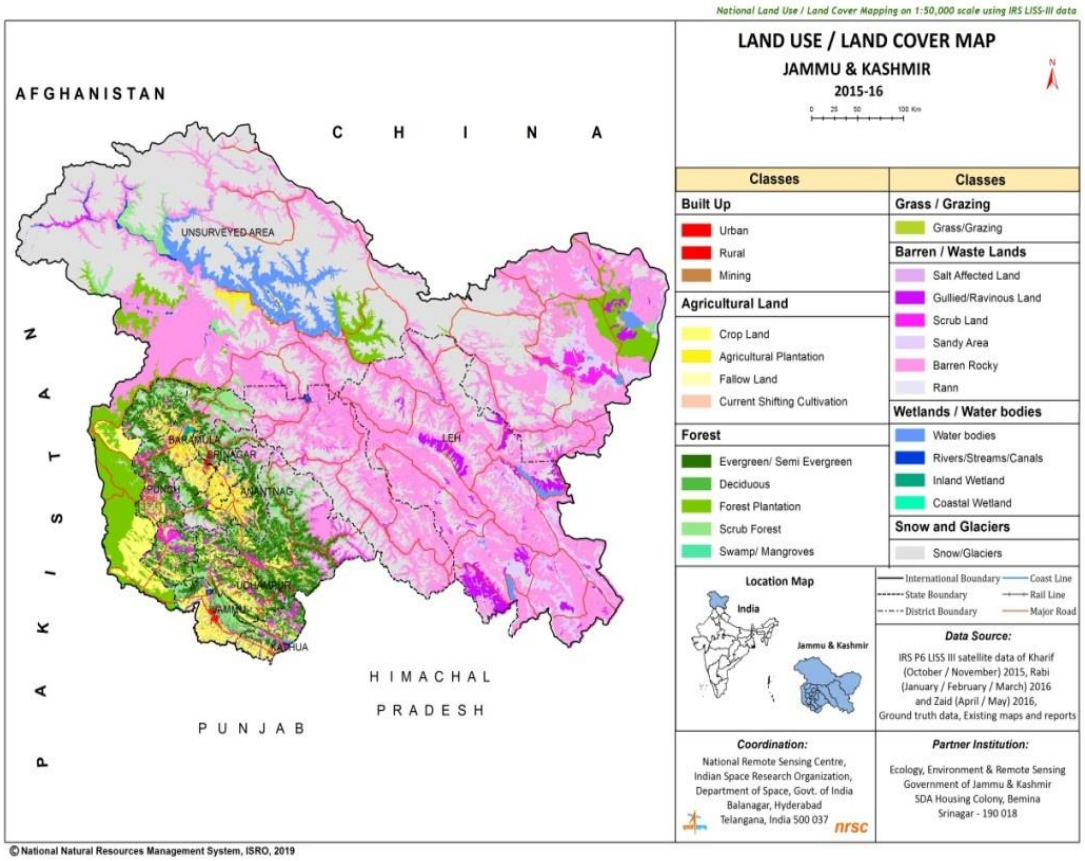


Fig 2.4 – Land Use and Land Cover of J&K UT including Ladakh (*Source: Bhuvan*)

2.2.8 Biodiversity

The data is combined for the both Union Territories viz., J&K and Ladakh as separate data is not available for newly constituted UTs after bifurcation of erstwhile J&K State. The UTs are rich in diversity of flora and fauna in the forest areas, and domesticated species outside the forests. Plant diversity is the life support of almost all terrestrial ecosystems, with both humans and animals being entirely dependent on plants directly or indirectly. The UTs has a fairly rich diversity of plant life, and on this the people depend for their daily needs of food, medicine, fuel, fibre, etc. Plants are also an integral part of the social fabric of the UTs.

Biogeographically, J&K and Ladakh UT comprise three distinct provinces: the subtropical (Jammu), the temperate (Kashmir) and the cold-arid (Ladakh). Owing to variety of habitats, these regions possess the great floristic diversity. There are about 4,626 species of plants in two UTs, of which 4,439 are Angiosperm, 19 Gymnosperm, 168 Pteridophyte species. About 58% species are endemic to the regions and 93 plant species of the region are threatened. In Kashmir Himalaya, a total of 2,312 species belonging to the land plants *viz.*, bryophytes, pteridophytes, gymnosperms and angiosperms. About 17% of the flora in Kashmir Himalaya has known or potential medicinal value. Most of the medicinal and aromatic plant species belong to the dicotyledons (Dar and Khuroo, 2013).

The faunal component of bio-diversity of the UTs is rich, with interesting and unique forms both in the forest zones and above the tree line. The variety of animal forms ranges from higher groups like vertebrates, including mammals, birds, reptiles, amphibians, and lower groups like invertebrates including insects and even unicellular micro-organisms. About 16% of Indian mammals are present in both UTs including birds, reptiles, amphibians and butterflies. Total faunal species of the region are 784, of which 75 area mammals, 358 birds, 14 amphibian, 44 fishes, 225 insects, and 68 reptile species. Seventy five species of mammals belonging to 54 genera, 21 families and 8 orders are found in UTs. Carnivores represent 32% of the total mammalian fauna of the UTs. A total of 19 species of ungulates is reported from the region, 13 have been listed as globally threatened. The avian diversity of UT varies seasonally and available data suggest the existence of as many as 358 species of birds belonging to 179 genera and 51 families under 16 orders. The UTs are the home of 14 species of amphibians belonging to 6 genera, 5 families and 1 order. Sixty eight species of reptiles belonging to 43 genera, 12 families and 2 orders are also found in the regions. Forty four species of fishes belonging to 14 genera under 5 families occur in UTs. About 225 species of insects, besides several sub-species, belonging to 136 genera, 35 families and 4 orders occur in the region (jkenvis.org). The rare mammals of the J&K and Ladakh UTs include Kashmir Stag or Hangul (*Cervus elephus hanglu*), Musk Deer (*Moschus moschiferus*), Tibetan Antelope or Chiru (*Panthelops hodgsoni*), Tibetan Gazelle (*Procapra picticaudata*), Serow (*Capricornis sumatraensis*), Markhor (*Capra falconeri*), Amon, Wild Yak (*Bosgrunniens*), Tibetan Wild Ass, Snow Leopard (*Panthera uncia*), Brown Bear (*Ursus arctos*) and Ibex (*Capra siberica*). Some of the rare and threatened birds found in the area include exotic species like Himalayan Golden Eagle (*Acquila chrysatos*), Bearded Vulture (*Gypaetus barbatus*), Monal Pheasant (*Lophophorus impejanus*), Koklas (*Pucrasia macrolopha*), Western Tragopan (*Tragopan melanocephalus*), Black Necked Crane (*Grus nigricollis*), Himalayan Snow Cock (*Tetraogallus himalayensis*.) and Bar-Headed Goose (*Anser indicus*).

2.2.9 Demography

Total combined population of Jammu and Kashmir and Ladakh Union Territories as per 2011 Census is 12,541,302, of which, male and female are 6,640,662 and 5,900,640, respectively. In 2001, total population was 10,143,700 in which males were 5,360,926 while females were 4,782,774. The total population growth in this decade was 23.64 % while in previous decade it was 29.04 %. Jammu and Kashmir UT has a Muslim majority population. As per Census 2011, Muslims constitutes 68.31% of Jammu and Kashmir population. In all, Muslim form majority religion in 17 out of 22 districts of Jammu and Kashmir and Ladakh UTs. Hindu are in minority in Jammu and Kashmir forming 28.44% of total population. Hinduism is followed with majority in 4 out of 22 districts (Census, 2011). Apart from the religious population, J&K UT has a number of tourist destinations and places of pilgrimage e.g., Srinagar, Gulmarg, Pahalgam, Sonmarg, Yusmarg, Verinag, Kokernag, Dodhpather, Lolab Valley, Gurez Valley, Jammu City, Katra, Mansar, Kishtwar, Sanasar, Patnitop, Bhadarwah, Vaishno Devi Temple, Peer Budhan Ali Shah or Peer Baba and Amarnath Temple, etc.

2.3 Need for Forestry Interventions

The J&K UT stands apart in terms of its water wealth when considering the total runoff, overall area of the water bodies and the length of the drainage pattern. In other words, its water features are the principle component that adds to its scenic beauty. However, the distribution of the water resources is extremely uneven due to its geomorphic features. Water is mostly plentiful in the low-lying areas and is mainly categorized by a number of freshwater streams, springs, lakes, and wetlands. Water being the elixir of life has been the driving force behind flourishing and development of new civilizations. Therefore, for availability, quantity and quality of water is still the fundamental cause of socio-economic prosperity and well-being of any region. Main sectors of the UT which are directly dependent on water resources include agriculture, irrigation, horticulture, hydroelectricity, and tourism. Water resources of J&K UT are governed by special commandments laid down under the Indus Water Treaty (IWT, 1960).

The availability and quality of clean water in many regions of the world is increasingly threatened by overuse, misuse and pollution. The intricate relationship between forests and water has been of interest for long to natural resource professionals and policy makers. It is a common knowledge that forests not only influence the hydrological cycle but they also have an effect on water resources both quantitatively and qualitatively (FAO, 2013). Forests make their most significant contribution in supplying the water. Forests help in the stabilization of soils, minimize erosion, trapping sediments and pollutants from other up-slope land uses and activities. Forests can protect water bodies and water courses, increase intercepting of precipitation, decrease evaporation of moisture from vegetative surfaces, transpiring soil moisture and play role in capturing fog water and maintaining soil infiltration. Since, forests improve soil infiltration and soil water-storage capacity; hence they influence the timing of water delivery. Despite of providing wide range of services by forests, their role in the regulation of water flows and safe water supply is often overlooked, and not taken into account when developing policies or water management plans. Hence, there is need to recognize and consider forest and water interaction in the broader landscape in context of rivers.

2.4 Riverscape Analysis

2.4.1 Methodology

For the present assignment, on the basis of directions from the MoEF&CC and consensus emerged in the extensive consultative process with various stakeholders out of 11,706.41 km^2 basin area, 9,173.61 km^2 area has been included in the riverscape delineated for the purpose of planning, assessment and proposed management by way of forestry interventions in the context of Ravi River whereas 2,532.8 km^2 area of the Basin has been excluded. All tributaries have been included as a part of the riverscape. In short, the entire catchment in the J&K UT, forms part of the riverscape. Riverscape area in J&K UT is 2,970.91 km^2 which constitutes 25.38% of total catchment area of Ravi River and 32.39% of total riverscape area. Image processing and

GIS tools used in the present assessment were ERDAS Imagine, Geo-media Professional, ArcGIS, and other application software. The GIS software provide the tools needed to store, analyze and display geographic information. Landsat 8 satellite data for the month of November & December 2018 has been used for preparation of Land use/ Land cover map of the riverscape. The Row, Path along with Date of Pass of the satellite data used in the current study for J&K UT covering the riverscape is given in Table 2.4.

Table 2.4 - List of Data Downloaded and Used in the Geospatial Analysis of the Ravi Riverscape in J&K UT

UT	Path	Row	Date of Pass	Satellite
Jammu & Kashmir	148	037	03-Dec-2018	Landsat-08
Jammu & Kashmir	148	038	17-Nov-2018	Landsat-08

2.4.2 Riverscape Profile

(A) Spatial Extent

The Riverscape in J&K UT, lies between 32˚15’29.95" to 32˚56'57.38" N Latitudes and 75˚ 4'57.99" to 75˚ 55'10.66" E Longitudes and occupies a geographical area of 2,970.91 km^2 which constitutes 32.39% of total riverscape area. The project area falls in Kathua, Samba, Billawar, Basohli, Bhaderwah and Ramnagar Forest Divisions of J&K UT. Major cities and towns situated on the banks of Ravi River and tributaries are Kathua, Samba and Basohli.

Details of the riverscape under consideration from the point of view of DPR are shown in Fig.2.5 and spatial extents UT-wise are presented in Table 2.5. The catchment, sub-catchment, watershed, sub-watershed and micro-watersheds of Ravi River is given in Fig. 2.6 to 2.10.

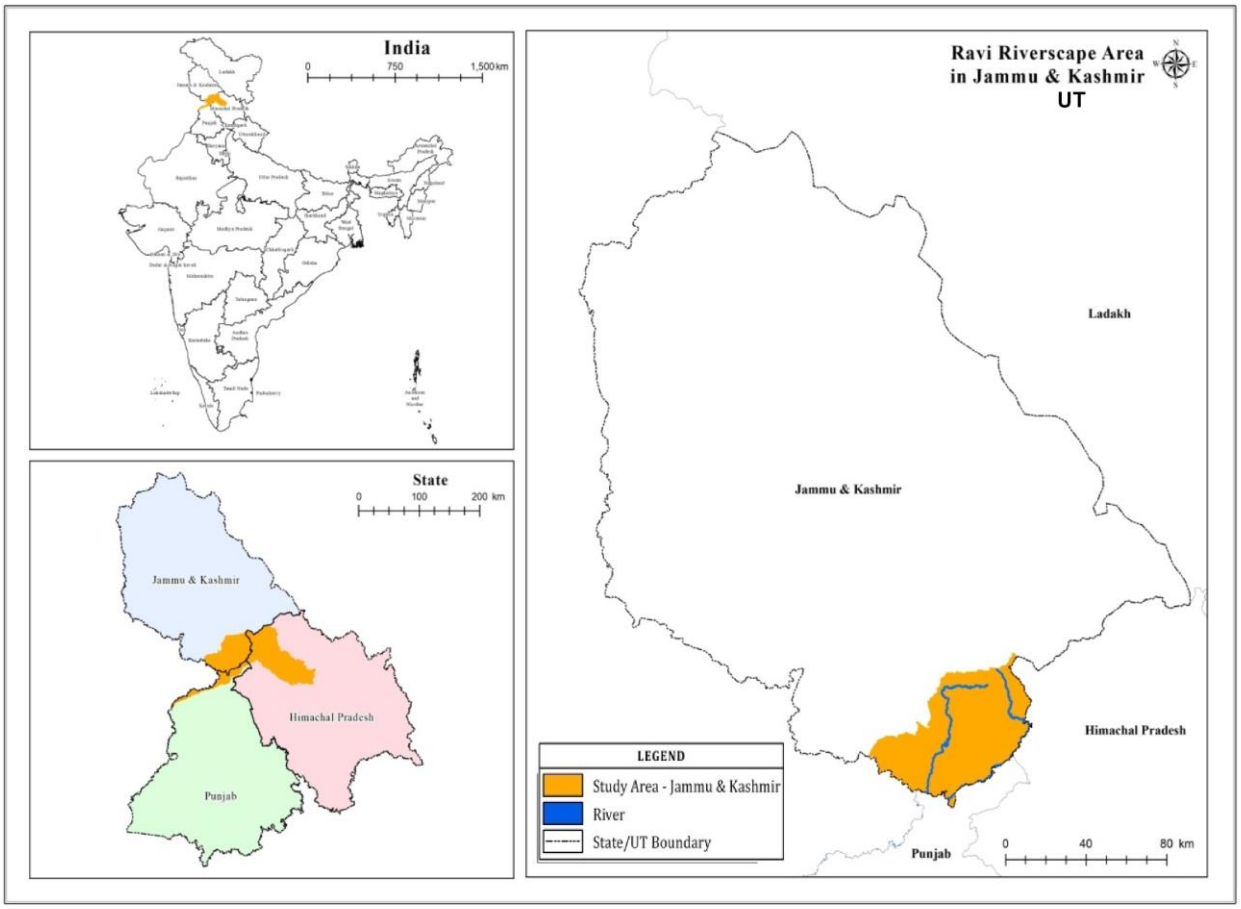


Fig. 2.5 - Ravi Riverscape Area in J&K UT

Table 2.5 - Spatial Extent of the Ravi Riverscape in the J&K, UT

Sr. No.	UT	Geographical Area of UT (km^2)	Catchment Area	Representative Area included in Riverscape (km^2)	Geographical Coordinates		Representative Area of Riverscape (%)
					N (Lat)	E (Long)	
1.	Jammu and Kashmir	53,258	2,970.91	2,970.91	32°16'34"N to 32°56'44"N	75° 4'11"E to 75° 56'6"E	32.39

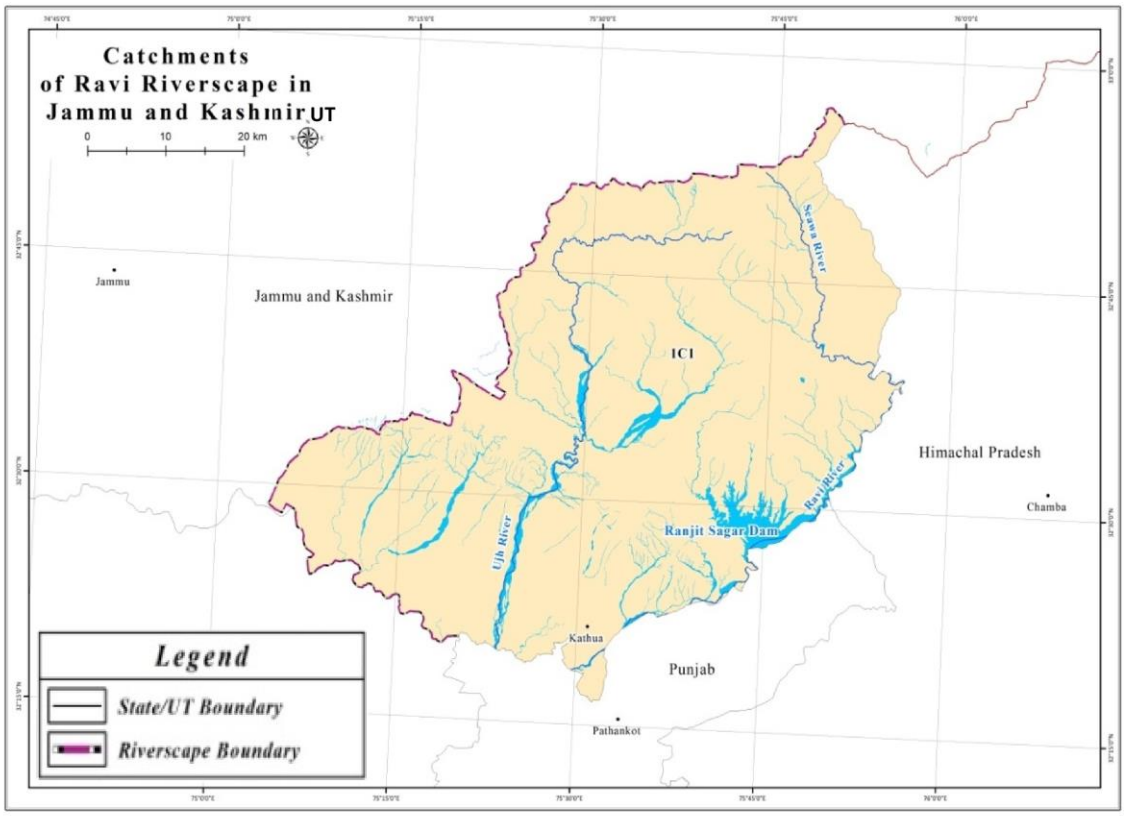


Fig. 2.6 - Catchment Area of Ravi Riverscape in Jammu and Kashmir UT

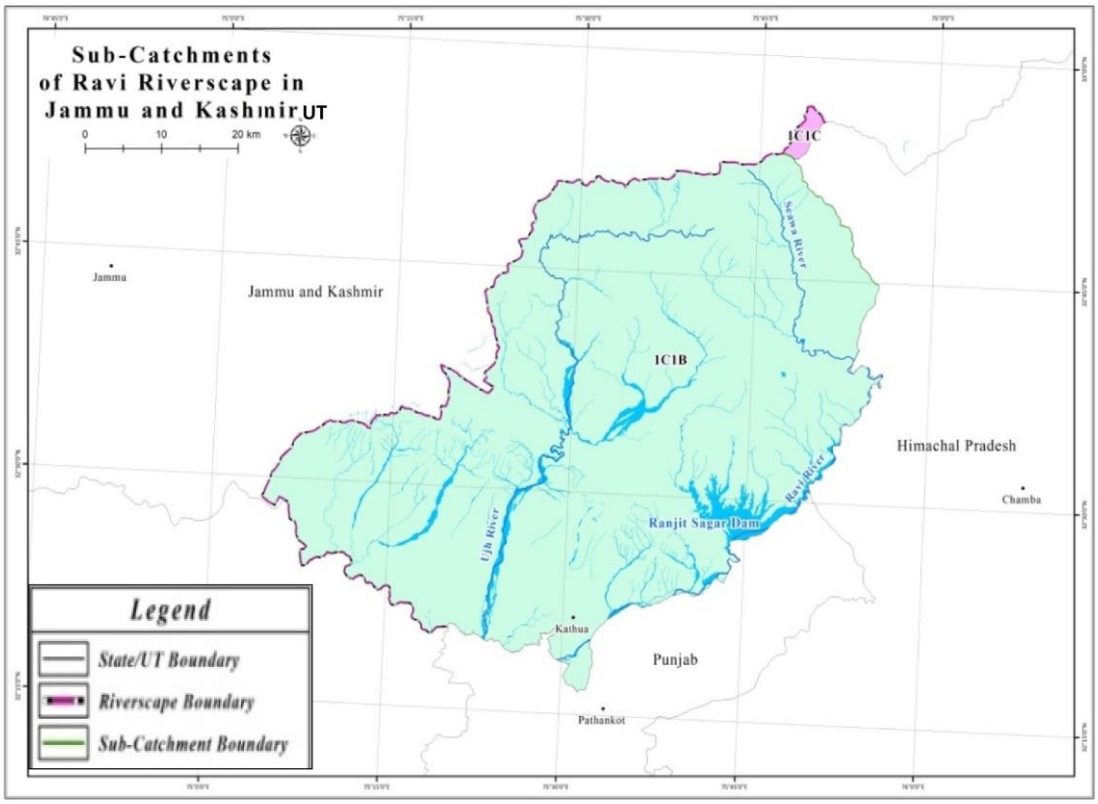


Fig. 2.7 - Sub-Catchmewnt of Ravi Riverscape in Jammu and Kashmir UT

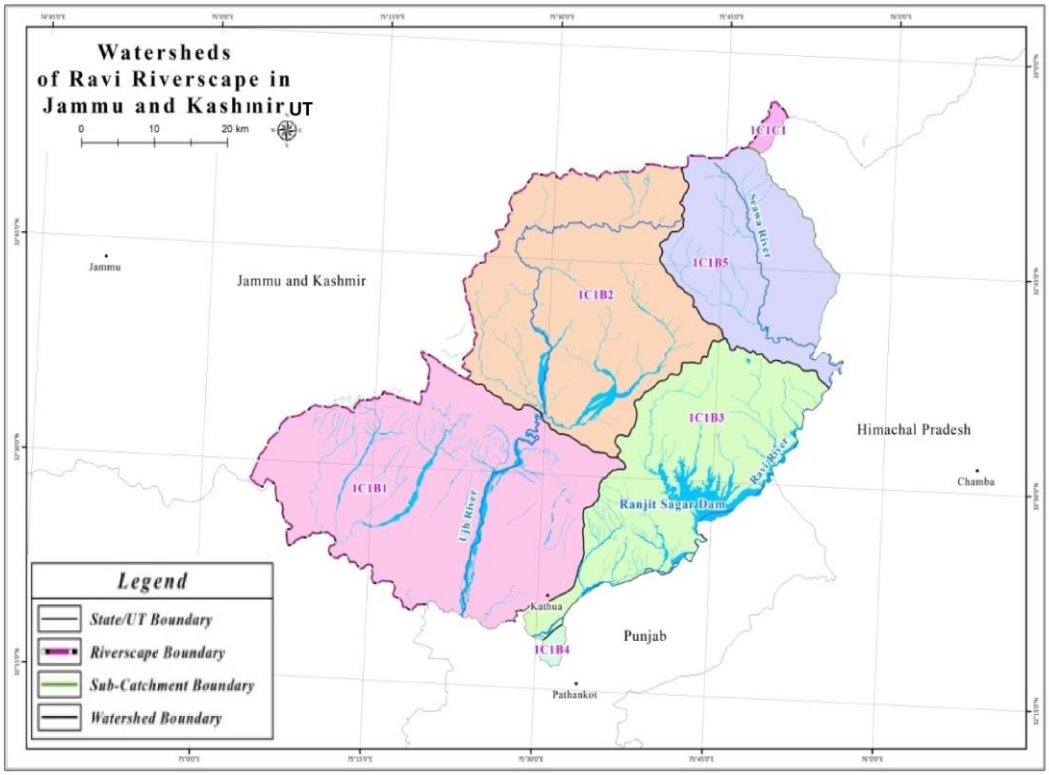


Fig. 2.8 - Watersheds of Ravi Riverscape in Jammu and Kashmir UT

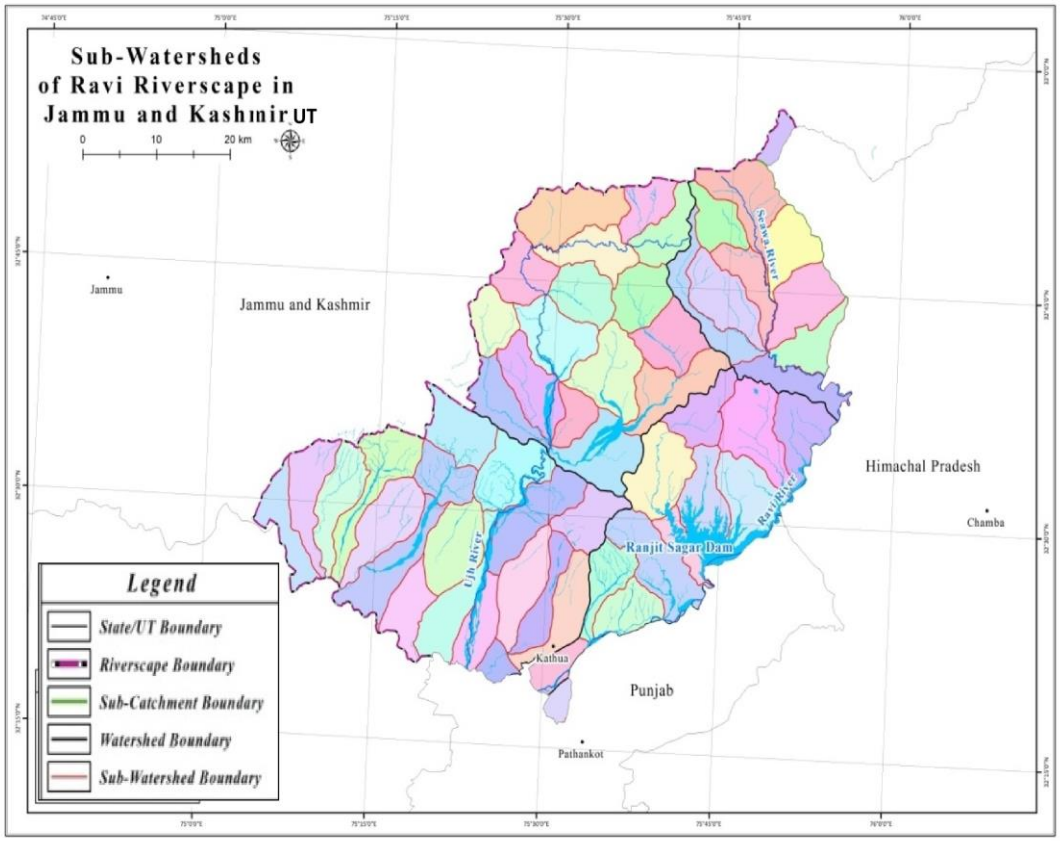


Fig. 2.9 - Sub-Watersheds of Ravi Riverscape in Jammu and Kashmir UT

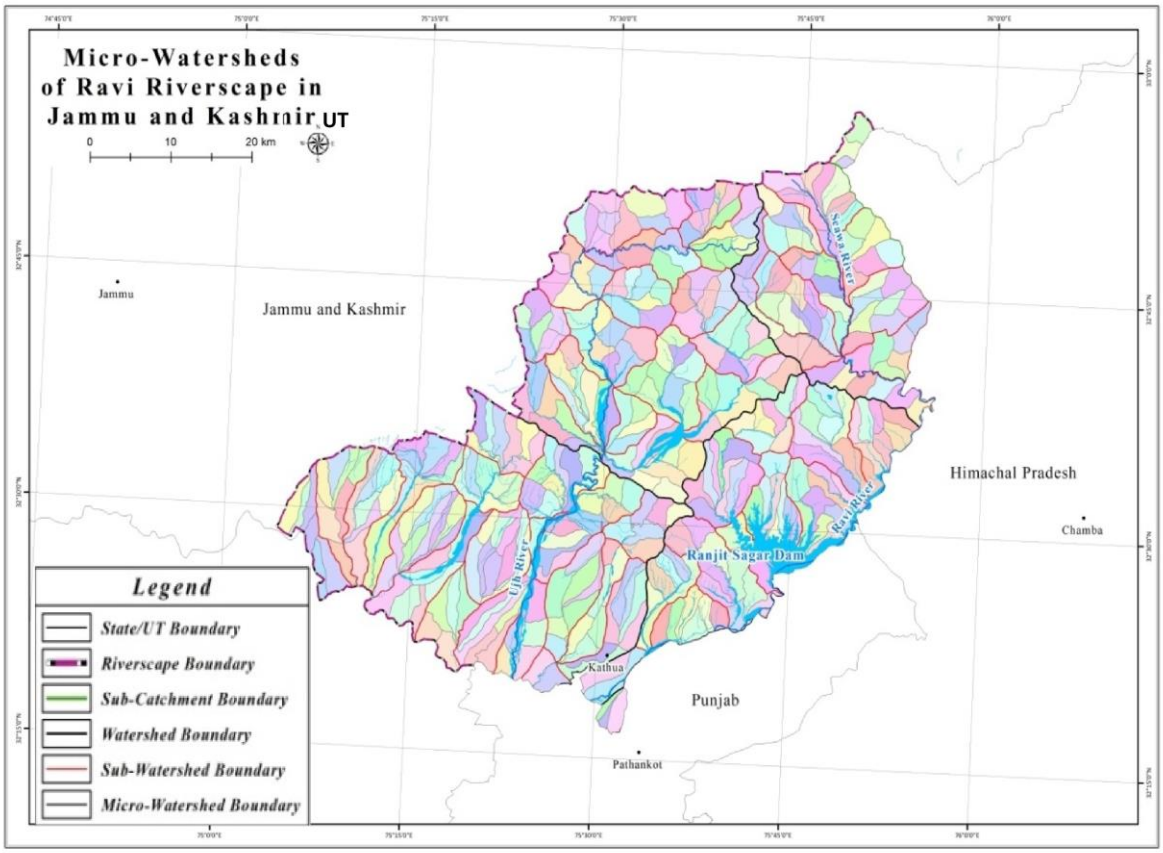


Fig. 2.10 - Micro-Watersheds of Ravi Riverscape in Jammu and Kashmir UT

(B) Land Use and Land Cover

A total of 14 major land use and land cover types i.e., Dense Forest, Moderately Dense Forest, Open Forest, Alpine Pasture, Alpine Pasture, Scrub, Barren, Settlement, Agriculture, Plantation, Water body, Canal, River (Perennial), River (Dry)/River sand and Snow/Glaciers have been delineated and mapped in the riverscape. The distribution of area under different land cover and land use classes is given in Table 2.6 and Fig. 2.11.

Table 2.6 - Distribution of Area under Different Land Use and Land Cover Classes in the riverscape

Sr. No.	Land used and Land cover (Jammu &Kashmir UT)	Area (km^2)
1	Dense Forest	265.03
2	Moderately Dense Forest	516.40
3	Open Forest	515.69
4	Alpine Pasture	0.16
5	Scrub	254.33
6	Barren	143.21
7	Settlement	37.83
8	Agriculture	999.91
9	Plantation	12.71

10	Water body	0.08
11	Canal	1.38
12	River (Perennial)	64.89
13	River (Dry)/ River sand	94.53
14	Snow / Glaciers	64.76
Total		**2970.91**

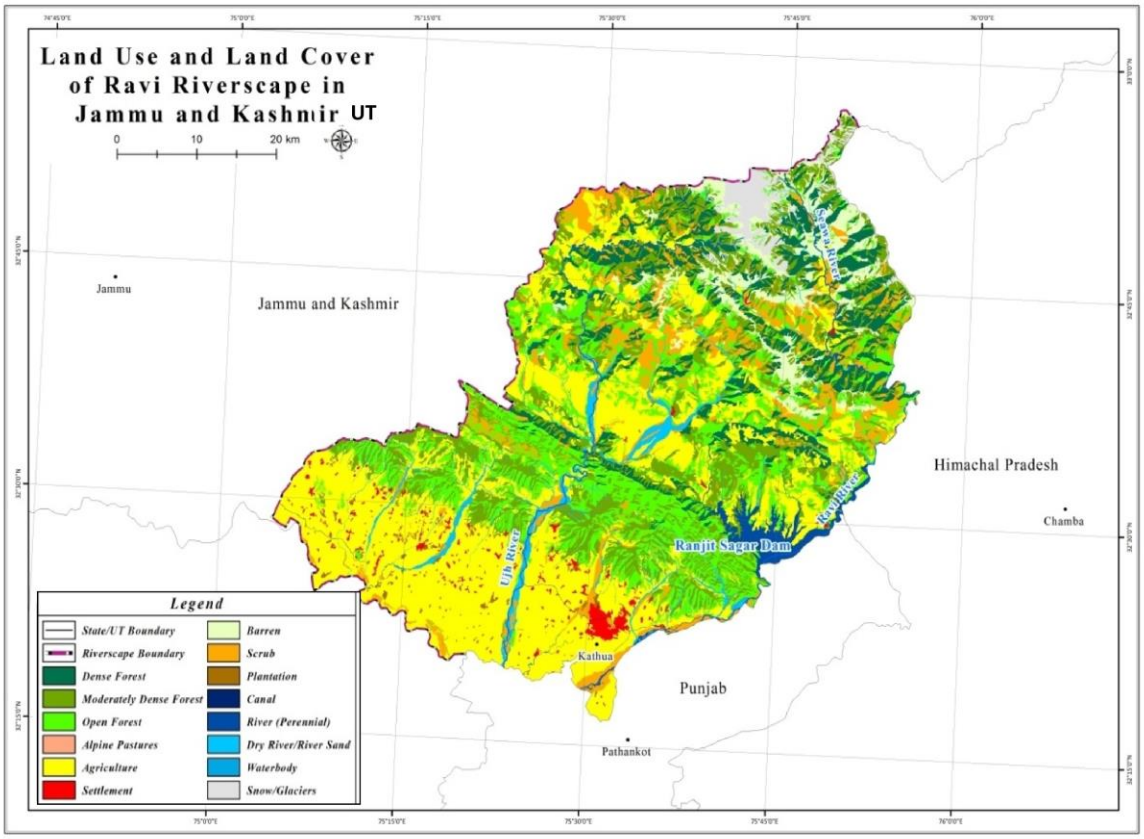


Fig. 2.11 - Land Use and Land Cover of Ravi Riverscape in Jammu and Kashmir

(C) Elevation

The area of the riverscape in J&K UT was grouped into 11 categories/classes. The distribution of areas under different elevation classes is given in Table 2.7 and Fig. 2.12.

Table 2.7 - Distribution of Areas under Different Elevation Classes of Ravi Riverscape in J&K UT

Sr. No.	Elevation (Jammu and Kashmir UT)	Area (km^2)
1	< 250	146.37
2	250 - <500 m	863.42
3	500 - <750 m	596.68
4	750 - <1000 m	204.36

5	1000 - <1250 m	155.59
6	1250 - <1500 m	155.59
7	1500 - <2000 m	161.67
8	2000 - <2500 m	164.68
9	2500 - <3000 m	403.17
10	3000 - <4000 m	115.97
11	4000 - 5000 m	3.41
Total		**2970.91**

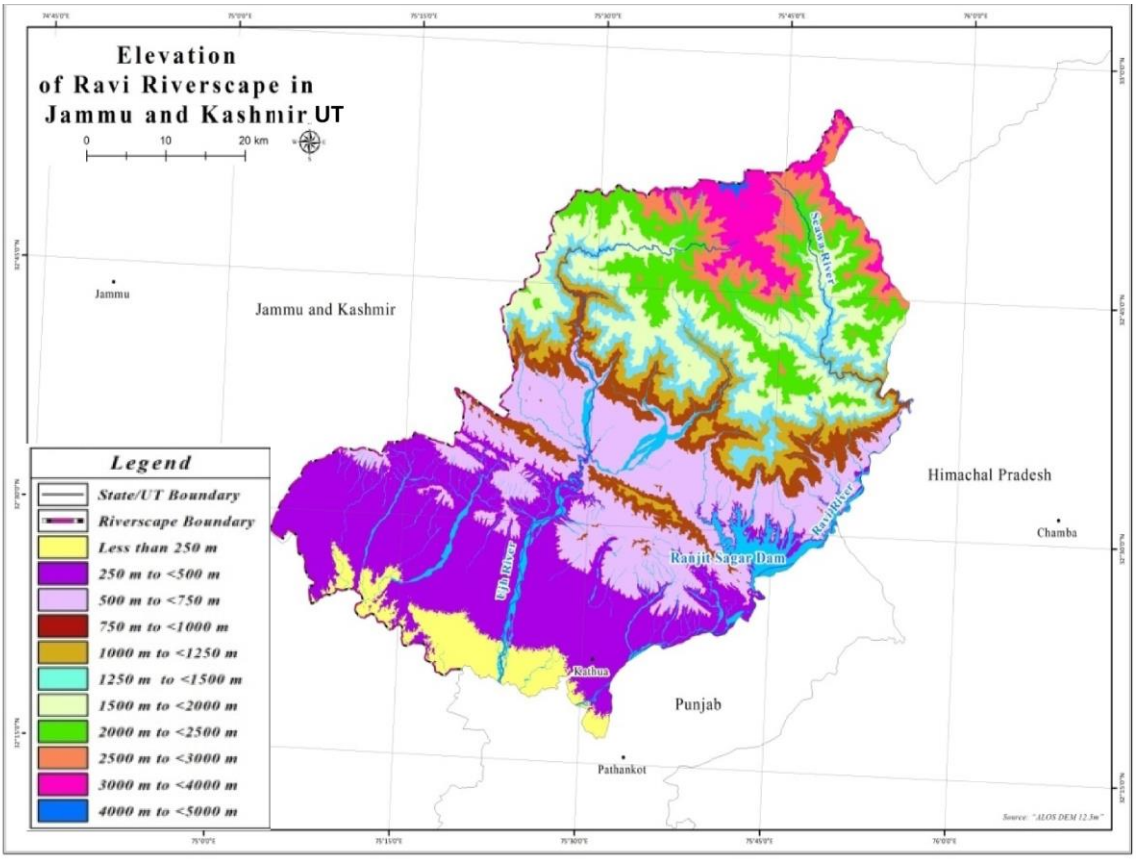


Fig. 2.12 - Elevation of Ravi Riverscape in Jammu and Kashmir UT

(D) Slope

Slope information is considered vital while suggesting suitability of areas for forestry interventions, particularly plantations. The higher degree of slopes (>30°) usually cause a lot of soil erosion and are prone to landslides, greater runoff, etc. Thus, areas with slopes >30° to 45° require safeguards from erosion while raising plantations of multiple values (fuel wood, fodder, small timber, etc.). A total of 10 classes of slope have been derived in the riverscape in J&K. The distribution of areas under different slope classes is given in Table 2.8 and Fig. 2.13.

Table. 2.8 - Distribution of Area under Different Slope Categories

Sr. No.	Slope	Area (km^2)
1	Less than 2.5	576.14
2	2.5 to <5	340.34
3	5 to <10	290.00
4	10 to <15	307.57
5	15to<20	353.75
6	20 to <25	295.65
7	25 to <30	283.76
8	30 to <35	240.57
9	35 to <40	167.59
10	≥40m	115.54
	Total	**2970.91**

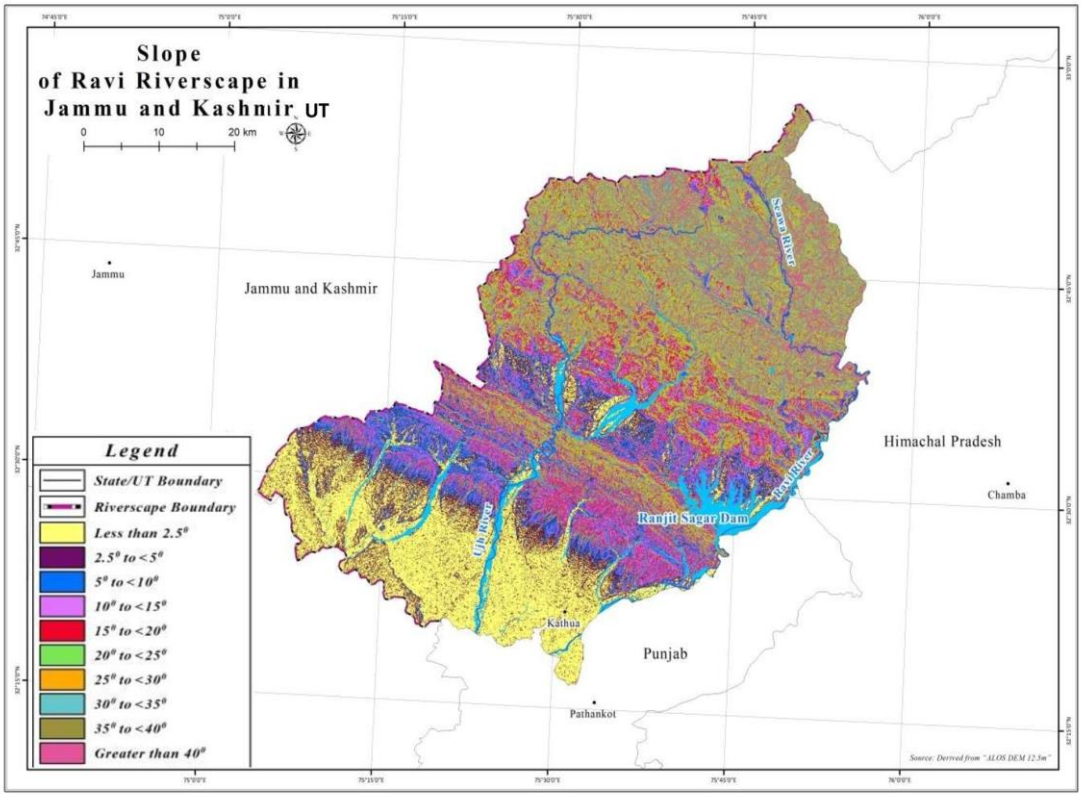


Fig. 2.13 - Slope of Ravi Riverscape in Jammu and Kashmir UT

(E) Aspect

Aspect, particularly in the Himalaya, influences the diversity and distribution of vegetation and microclimate. North and South facing opposing slopes vary in their microclimate; light intensity, soil and air temperature, humidity, soil moisture and evaporation and duration of growing periods and these differences are closely associated with differences in vegetation composition and structure. The aspect map has been derived from the ALOS DEM. A total of nine categories viz., North, North-East, East, South-East, South, South-West, West, North-

West and the Flat land has been analyzed in the study area in J&K UT. The distribution of areas under different aspect classes is given in Table 2.9 and Fig. 2.14.

Table 2.9 - Distribution of Percentage of Total Area in Different Aspect Categories

Sr. No.	Aspect	Area(km^2)
1	Flat (-1)	167.33
2	North (0-22.5,337.5-360)	216.03
3	Northeast (22.65-67.5)	257.67
4	East (67.5-112.5)	316.38
5	Southeast (112.5-157.5)	429.66
6	South (157.5-202.5)	467.38
7	Southwest (202.5-247.5)	493.03
8	West (247.5-292.5)	364.8
9	Northwest (292.5-337.5)	258.63
Total		**2970.91**

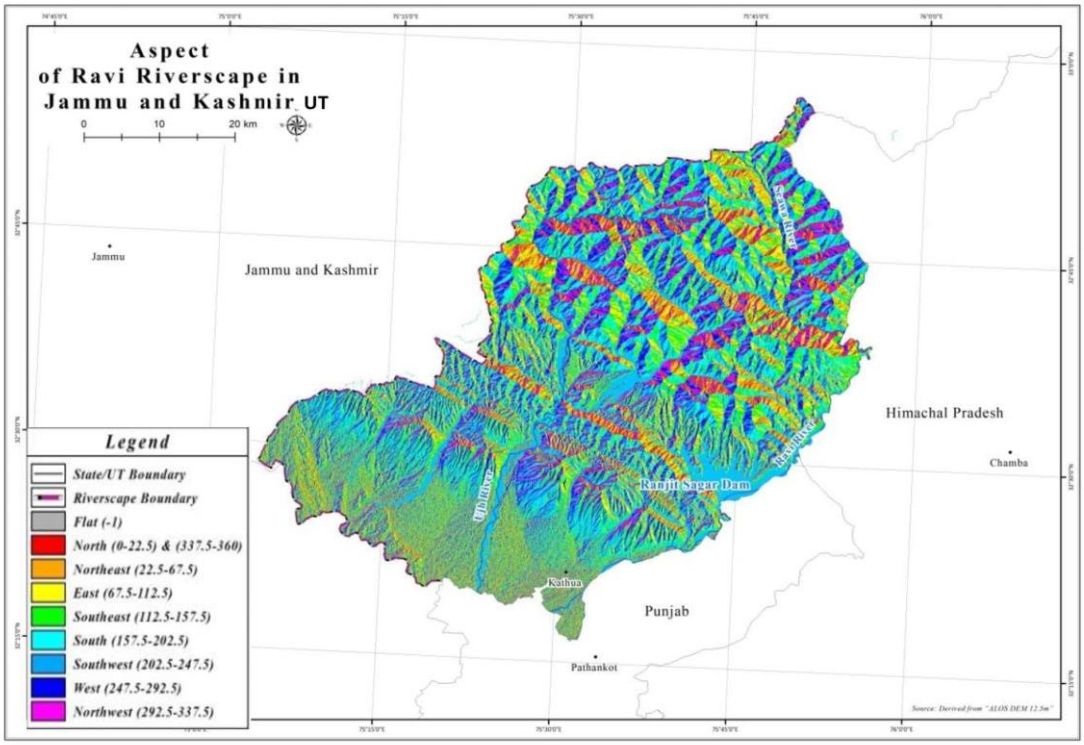


Fig. 2.14 - Aspect of Ravi Riverscape in Jammu and Kashmir UT

(F) Soil Type

Soil is considered as one of the most important parameter for modelling suitability of forest plantation zones. Since choice of species mainly depend upon the soil type and soil depth these parameters have been derived from Soil map prepared by NBSS-LUP for further use in

modelling in the present study. A total of 10 soil type classes have been recorded in the riverscape in J&K UT. Various soil types and their proportionate area estimates are given in Table 2.10 and Fig. 2.15. The soil type i.e., Dystic Eutrochrepts was the most dominant soil type in the Ravi Riverscape in J&K UT followed by Typic Udorthents.

Table 2.10 - Distribution of Area under Different Soil Types and Other Land Attributes

Sr. No.	Soil Type	Area (km^2)
1	Dystric Eutrochrepts	1203.19
2	Fluventic Eutrochrepts	99.50
3	Typic Udorthents	854.34
4	Typic Ustorthents	20.32
5	Udic Ustorthents	148.83
6	Lithic Udorthents	184.99
7	Mollic Udorthents	1.63
8	Typic Eutrochrepts	22.29
9	Udic Ustochrepts	205.20
10	Typic Udifluvents	96.69
11	Non-soil	133.93
Total		**2970.91**

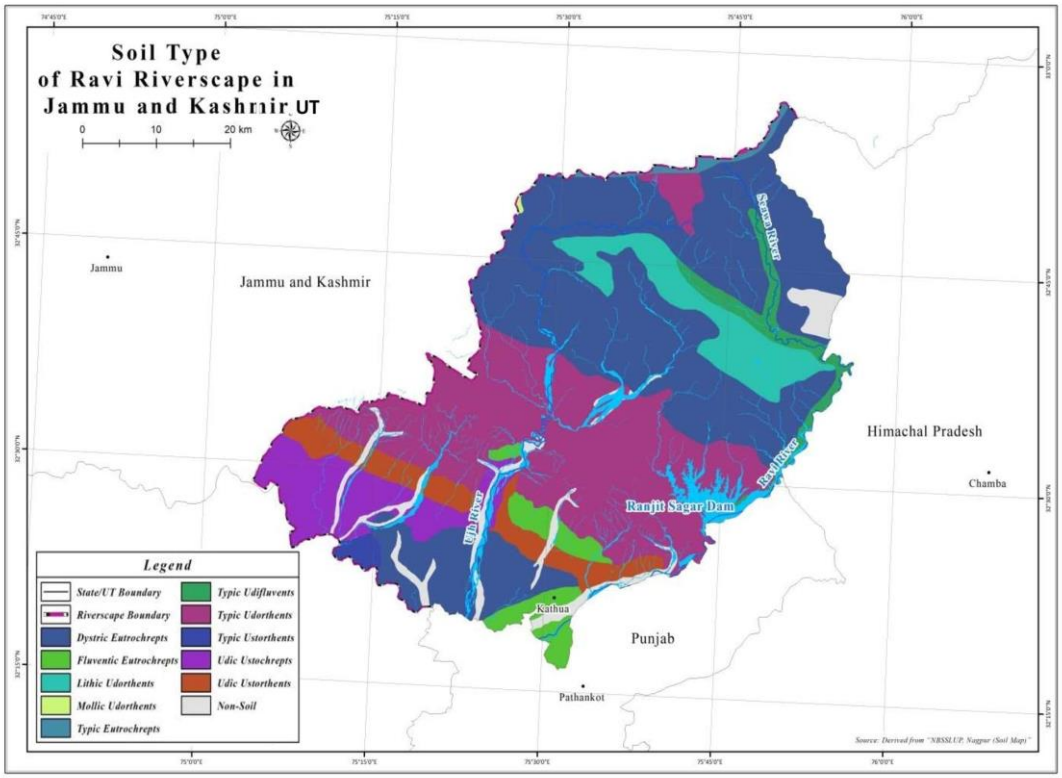


Fig. 2.15 - Soil Type of Ravi Riverscape in Jammu and Kashmir UT

(G) Soil Depth

Soil depth can greatly influence the type of plants that can grow in them. Deeper soils generally provide more water and nutrients to plants than more shallow soils. Soil depth is another important variable for suggesting suitability of tree species for a plantation. The depth is important for the penetration of the roots of plant or tree species. Five depth classes, *vis*., Very Deep, Moderately Deep, Deep, Shallow, and Very Shallow have been mapped in Ravi Riverscape. The distribution of area under different soil depth classes is given in Table 2.11 & Fig. 2.16.

Table 2.11 - Distribution of Area under Different Soil Depth Classes

Sr. No.	Soil Depth	Area (km^2)
1	Deep	1347.56
2	Moderately deep	917.17
3	Shallow	23.09
4	Very shallow	549.16
5	Non-soil	133.93
Total		**2970.91**

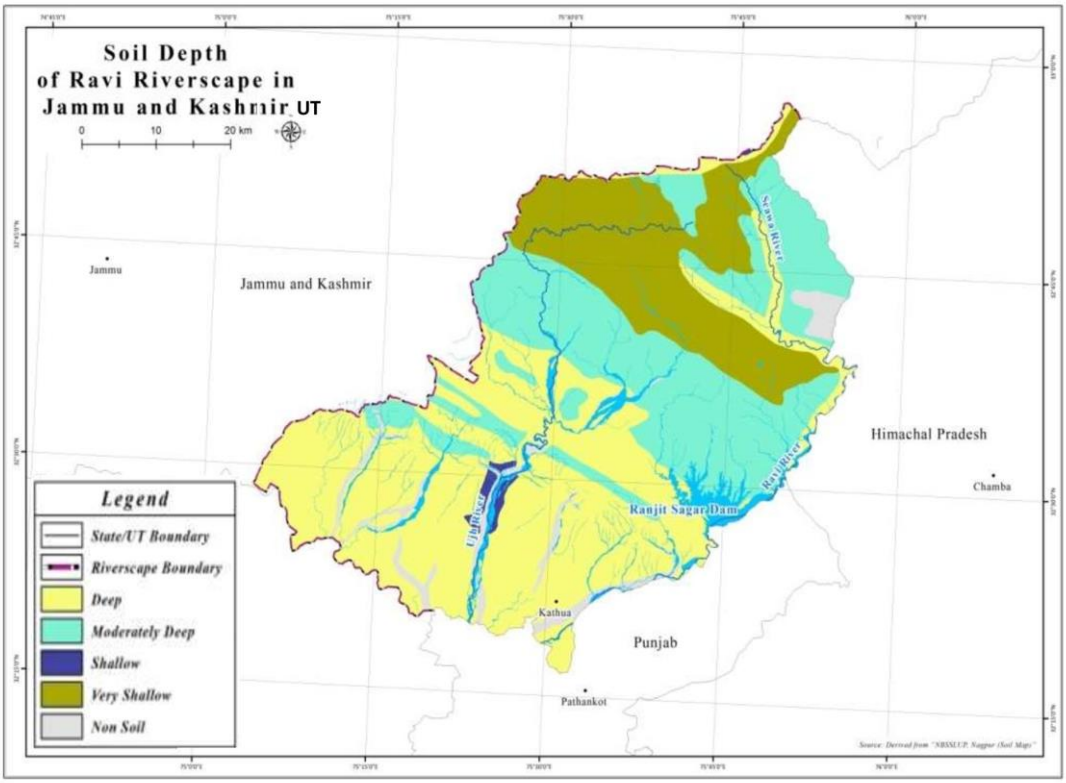


Fig. 2.16 - Soil Depth of Ravi Riverscape in Jammu and Kashmir UT

(H) Soil Erosion

Human activities caused by intensive agriculture, deforestation, construction/widening of roads, construction of hydroelectric projects, urban sprawl and erratic climatic conditions are some of the prominent factors responsible for soil erosion in the mountainous catchment of Ravi River. A total five categories of erosion classes have been mapped in the riverscape, *viz*., < 5 t ha^{-1} yr^{-1}; 5 t ha^{-1} yr^{-1} to <10 t ha^{-1} yr^{-1}; 10 t ha^{-1} yr^{-1} to 20 t ha^{-1} yr^{-1}; >20 t ha^{-1} yr^{-1} to 40 t ha^{-1} yr^{-1}; and ≥ 40 t ha^{-1} yr^{-1}. An area of 139.26 km^2 falls under non-soil category. These areas may not be suitable for forest plantations. The distribution of areas under different erosion classes and their area is given in Table 2.12 and Fig. 2.17.

Table 2.12 - Distribution of Area under Different Soil Erosion Categories in Ravi Riverscape in J&K UT

Sr. No.	Soil Erosion	Area (km^2)
1	<5	1558.64
2	5-<10	281.85
3	10-<20	136.37
4	20-<40	151.30
5	≥40	703.49
6	Non Soil	139.26
Total		**2970.91**

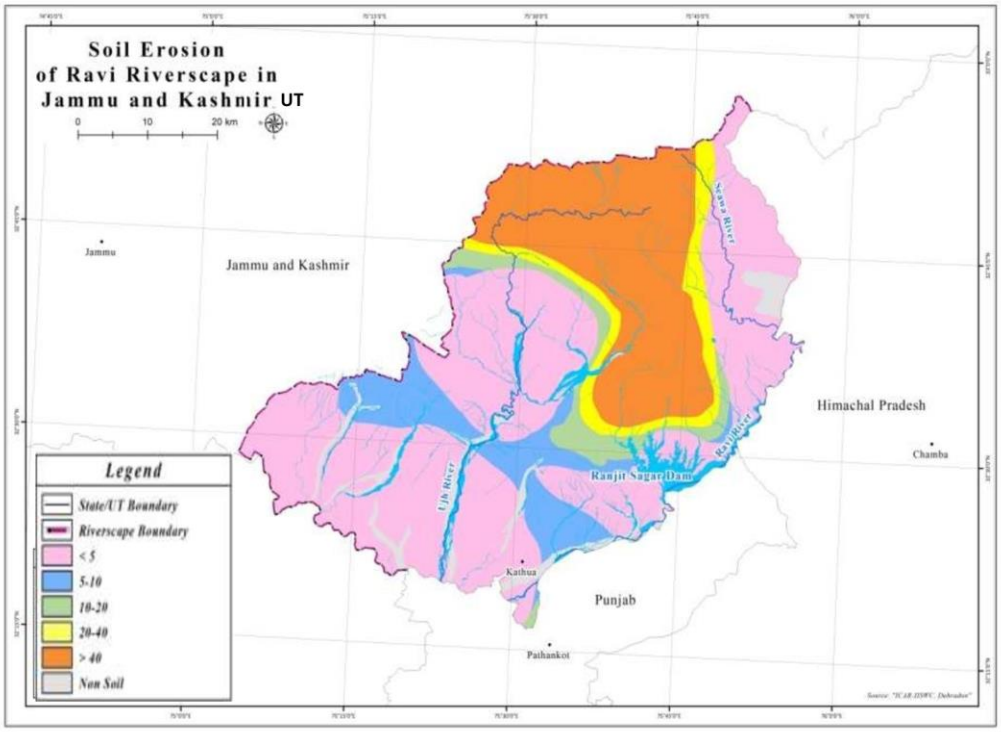


Fig. 2.17 - Soil Erosion of Ravi Riverscape in Jammu and Kashmir UT

(I) Forest Types

The vegetation type information is most important in suggesting suitable sites based on areas which do not have dense forest cover or which are falling in scrub and grasslands along the river banks. Distribution of Area under Different Forest Types Categories is described in Table 2.13 and Fig. 2.18.

Table 2.13 - Distribution of Area under Different Forest Types Categories in Ravi Riverscape in J&K UT

Sr. No.	Forest Type	Area (km^2)
1	Himalayan moist temperate forest	239.00
2	Subtropical pine forest	436.90
3	Tropical dry deciduous forest	619.09
4	Sub alpine forest	2.13
5	Scrub	254.33
6	Non forest	1419.46
Total		**2970.91**

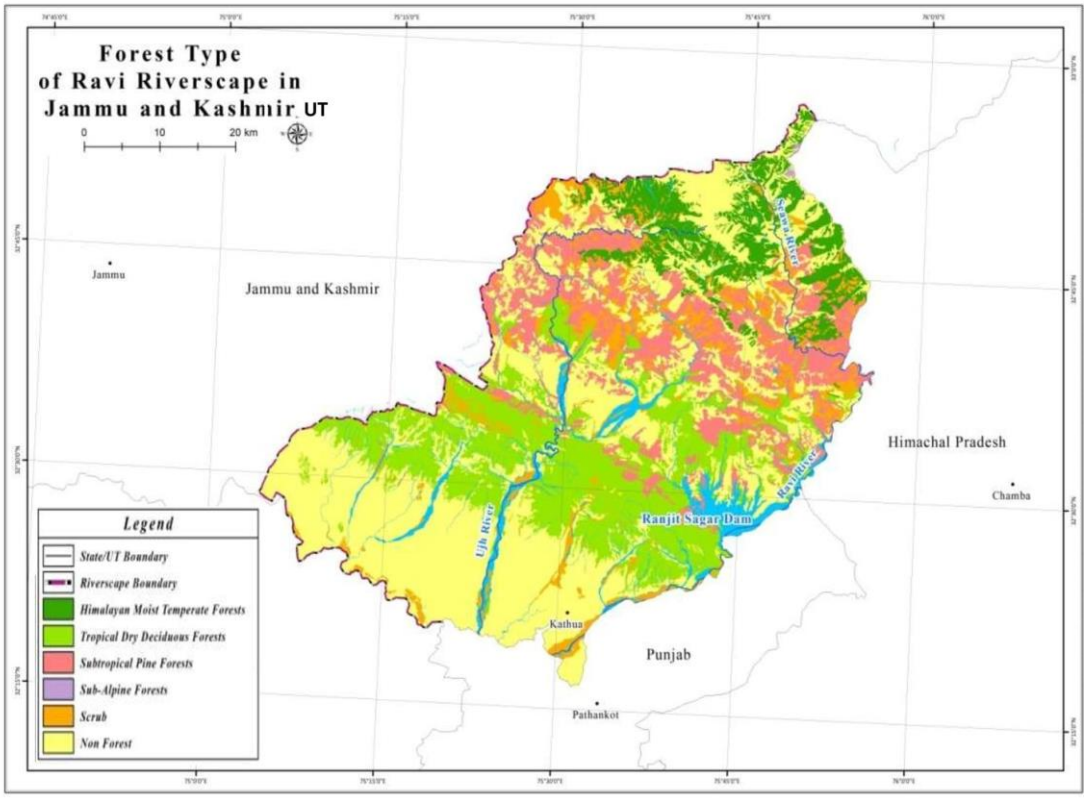


Fig. 2.18 - Forest Types of Ravi Riverscape in Jammu and Kashmir UT

(J) Forest Cover

The Moderately dense forest occupied the highest cover and occupies 516.40 km^2 area whereas Dense forests occupy 265.03 km^2 area in J&K UT. Distribution of Area under Different Forest Cover Categories is described in Table 2.14 and Fig. 2.19.

Table 2.14 - Distribution of Area under Different Forest Cover Categories

Sr. No.	Forest Cover	Area (km^2)
1	Dense forest	265.03
2	Moderate dense forest	516.40
3	Open forest	515.69
4	Non forest	1419.46
5	Scrub	254.33
Total		**2970.91**

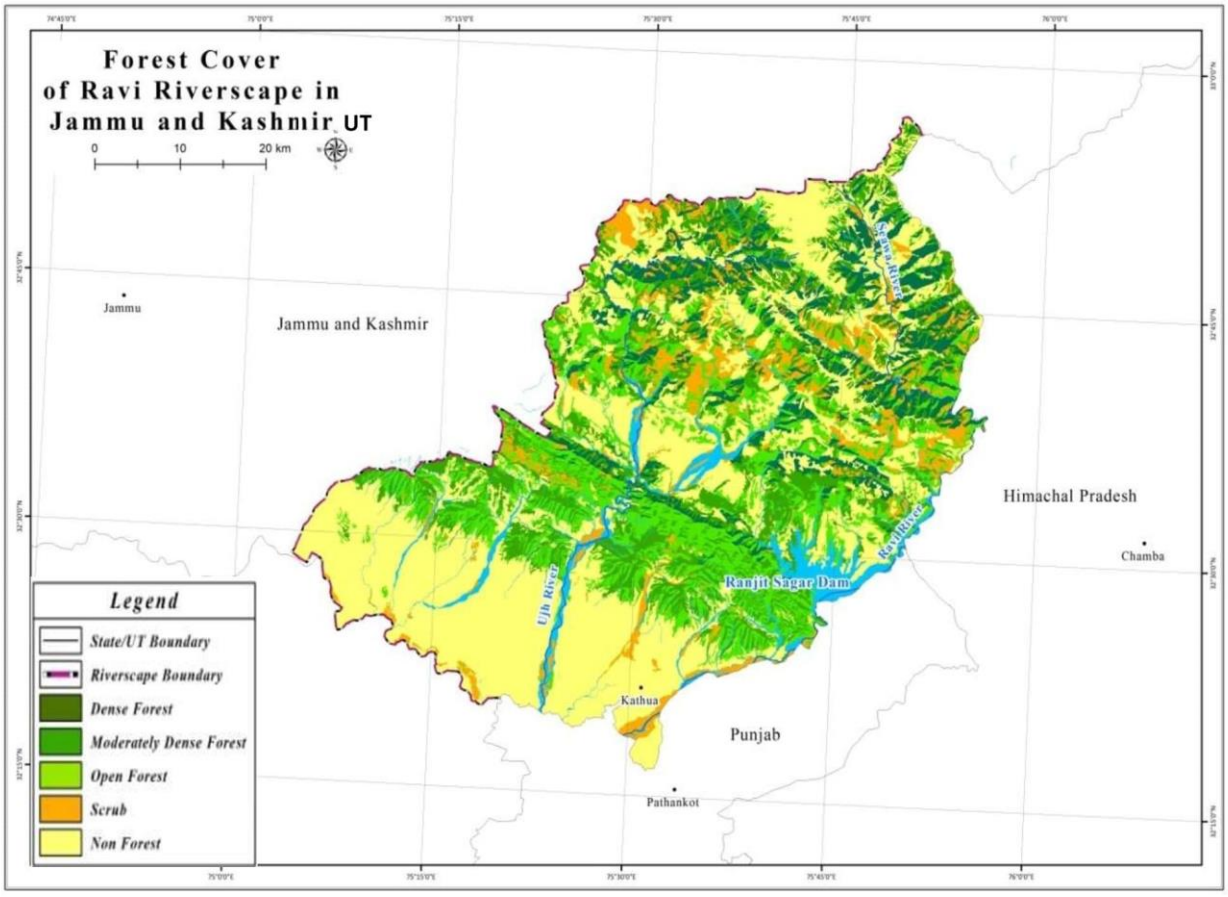


Fig. 2.19 - Forest Cover of Ravi Riverscape in Jammu and Kashmir UT

(K) Priority Treatment Area

For identifying of priority areas in three priority categories viz., 'High', 'Medium and 'Low' for the proposed treatments/forestry interventions in the Ravi Riverscape and selection of appropriate models, GIS-assisted geospatial analysis and modeling were used. Priority areas were delineated in J&K UT and described in Table 2.15 and Fig. 2.20.

Table 2.15 - Prioritized Area of Ravi Riverscape in J&K UT

Sr. No.	Priority (Jammu and Kashmir UT)	Area (Km^2)
1	High	927.99
2	Low	963.01
3	Moderate	1079.91
Total		**2970.91**

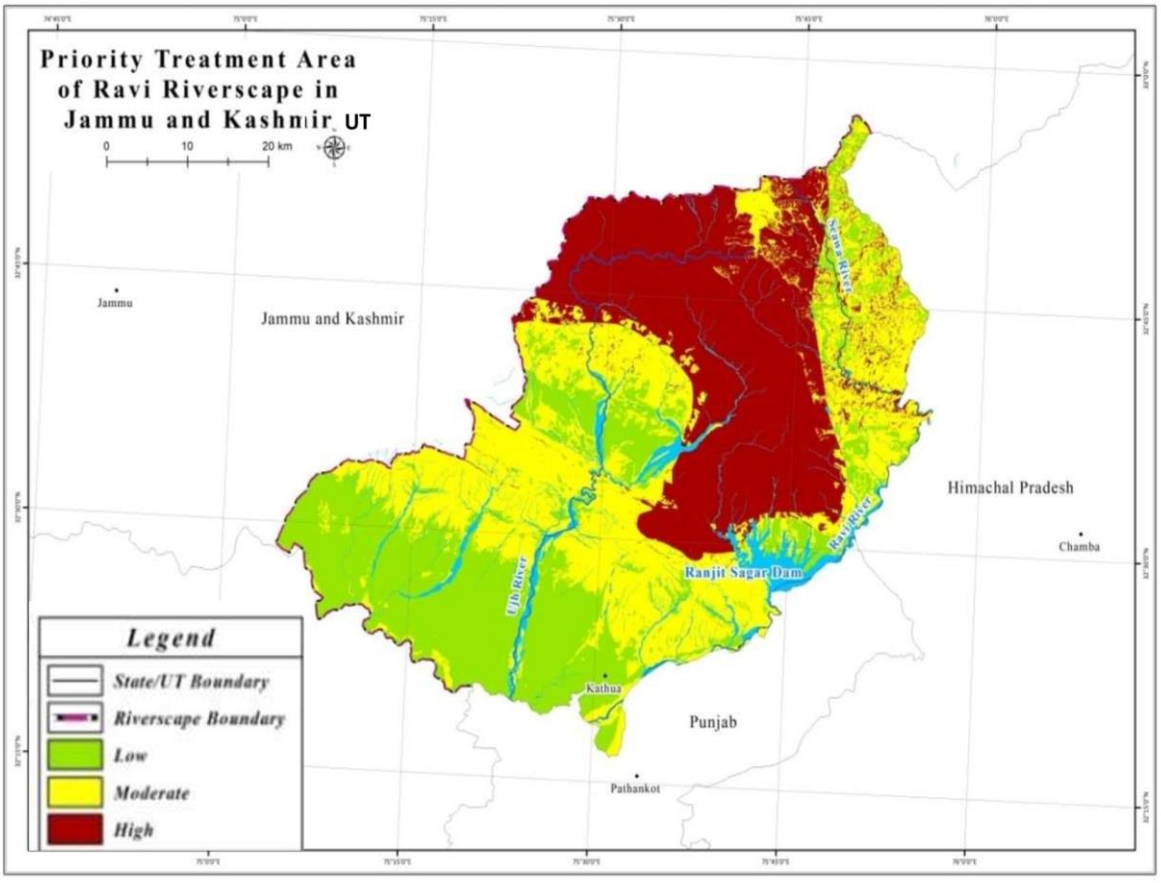


Fig. 2.20 - Priority Treatment Areas of Ravi Riverscape in Jammu and Kashmir UT

2.5 Proposed Forestry Interventions

Model-Wise Treatment Plans under Three Lower Order Zones

The treatment plans for 17 proposed models (i.e., Natural-12; Agriculture-02; and Urban-03) meant for three lower order zones or Landscapes (Natural, Agriculture Landscape and Urban Landscape) within the Riverscape are elaborated below one by one. In case of each model, the treatment plan includes the details on site characteristics, recommended species for plantations, specific activities and cost norms.

In general, following guidelines would be applicable to all proposed Plantation Models meant for three different Landscapesviz. Natural, Agriculture and Urban Landscape and Three types of Conservation Interventions viz. Soil & Water Conservation, Riverine and Riparian Management, and Wetland Management within the riverscape:

a) All the Models/ Interventions are prescribed which come under Forestry Interventions in proposed DPR of Rivers.
b) Native species of trees, shrubs, herbs and grasses would be selected for proposed treatment models/ plantations in consultation with stakeholders of the respective States/UT. Traditional and prominent horticultural and ornamental species those under cultivation in the region for quite sometime, are proposed in the Agriculture and Urban Landscapes. Mixed plantations are proposed as far as possible instead of monoculture for enhancing plant diversity and greater ecosystem services. The species are proposed according to their occurrence in the altitudinal zones however, Implementing Agencies may plant site specific species also.
c) Suitable native species suggested for different plantation models are finalized after due consultation with Forest Department and other stakeholders of concerned States/UTs. Native species proposed for plantation under each treatment models are provided in the following section. In addition, landscape-wise model description has been further supplemented with the species-wise attributes and model-wise listing in Annexure 3 and Annexure 4, respectively
d) The necessary preparations for planting works including digging of pits would be completed two-three months before the onset of monsoon or planting season. However, the period between pit digging and scheduled planting time would not be more than four months so that run-off of soil by wind and water could be minimized.
e) Appropriate quantity of farmyard or organic manure or AM would be applied to boost plant growth in nurseries and plantation sites. Eco-friendly measures (i.e. physical or mechanical methods, use of natural products, etc.) for weed and pest control would be adopted without resorting to the use of synthetic chemicals
f) Plantation sites would be protected against all types of biotic disturbances and abiotic stresses so as to effectively safeguard planted material for three years through fence, watch and ward, as well as local public awareness programmes and their active involvement.

g) The Implementing Agency should either develop modern and centralized nurseries or identify various certified Research Institutes, Universities, NGOs, Institutions and progressive farmers for supply of best quality planting material.
h) The Schedule of Rates (SoR) is adopted from prevailing SoR of respective States/UTs. For Himachal Pradesh, SoR of Shimla Forest Circle for the year 2012-13 @ wage rate of Rs.150/ with increase of 66.66% i.e., Rs. 250/-, for J&K UT SoR of 2017 @ Rs. 225/- has been applied. Also an increase of 7% has been added each year i.e., 2nd year onwards to compensate inflation.
i) The budget will be provided after submission of Annual Plan Operations (APO) for each year. So the prevailing wage rate will be applicable whenever DPR is implemented. Also site can be changed as per the availability at the time of implementation wherever required.
j) In Himachal Pradesh, further 25% hike in wage rates would be applied for Tribal Areas
k) The fencing cost has been calculated on average basis of enclosure of area to the extent of 5 hectare and average carriage lead is taken as 1 km (up & down)
l) The nursery time for plants in multitier model is taken on average basis i.e., 1.5 – 4.5 year so average is 3 years, for calculating the norm. Also the plant cost is taken from the norm prescribed by the Forest Department of respective States.
m) These cost Norms indicate the upper limits. The expenditure will be booked under various items shown in the detailed models as per actual work done in the field as per Schedule of Labour rates of the respective States/UTs and will not exceed these Departmental Norms.
n) The suggestive cost models are to create multistoried forest cover for improving the bio-diversity of the area which in turn conserves the water and soil in-situ.
o) In *Lantana* eradication models or wherever Lantana removal is involved, the Cut Root Stock (CRS) method should be adopted.
p) The fencing work includes the 4-strands of barbered wire with interlacing of thorny bushes.
q) In Fire Protection Model, as area is virtually targeted, hence Implementing Agency should rotate fire protection operations in areas of the Division so that each selected area takes operations after 3 years.
r) In Agriculture models the guidelines of Sub-Mission on Agroforestry (SMAF) of Central Government should be considered as being adopted in States and UT.
s) Under Urban Landscapse, the Seechewal Model (Punjab) for bio-remediation and bio-filteration may be taken into consideration.
t) Also in Urban Landscape, Eco-Park Development, Institutional Plantation and Riverfront Development models can be converged with Nagar Van Yojna as launched by GoI.
u) In Soil and water conservation models, the watershed approach and techniques should be adopted for desired results. For this intervention the Annual Plan Operation (APO) should be submitted each year with the proposal of micro plan of specific sites with detailed estimates.
v) In Riverine and Riparian Management and Wetland Management models, areas shown in budgetary provisions are virtual and concerned Implementing Agency (IA) should

clearly mention the proposed activities in Annual Plan operation (APO) to be taken up in particular area with detailed microplan and estimates.

w) Plantation models are for the general areas as proposed by the Territorial Divisions but for the protected areas, two models under Conservation Intervention *viz*. Riverine and Riparian Management and Wetland Management are propsed.

x) The prescribed models, identified sites, area of the sites, species and rates may be modified to suit local conditions at the time of implementation of project and the concerned conservators of forests shall exercise the power to approve such changes as and when requires.

y) **Cost Indexing:** The project costs have been worked out on the basis of rate prevalent during year 2019-20 in the respective State/UTs and 7% escalation in the project cost during the subsequent years has been incorporated in anticipation of the cost escalation in future. However, actual project cost at the time of implementation on yearly basis shall need revision as per the change in Wholesale Price Index (WPI) on year to year basis. The Conservator of Forest may be empowered to revise the project cost accordingly for the quality desired output of the project.

2.5.1 Natural Landscape

As already stated, various natural land use and land cover categories together constitute the largest area of the Ravi Riverscape and it is represented by diverse forests, alpine pastures, scrub, snow cover/glaciers, rivers, wetlands, etc. Thus, the maximum number of treatment models has been proposed in the mountainous/ hill portion of the riverscape in Jammu region. Interventions are proposed to be implemented in the entire upper basin of the Ravi River and its tributaries. Primarily, these models would be applied on forest lands under the control of SFD, J&K UT. The proposed treatment sites would mainly include areas under open forest, scrub, grasslands, and alpine pastures or along the river and its tributaries. Details of each of the 12 treatment models prescribed in the natural landscapes are presented below.

Table 2.16 - Modelwise Description of Natural Landscapes of Jammu and Kashmir, UT

Sr. No.	Model No.	Model Name	Description
1	**RV/JK/NL/01**	**Sub-Alpine Conservation**	The sub-alpine and moist alpine zones are mostly snow-bound that occurs between 3,600 - 4,100 m amsl. The temperature remains below 5° C for 6 months in a year. The active plant growth season is of almost 4-6 months. This region has varied rock formations. Grasses and herbs with scattered shrubs is dominant vegetation. A low deciduous scrub formation usually about 1 m high forms a dense cover in some patches. Under this model, it is proposed to conserve and augment vegetation of the alpine meadows. Conservation of native species and livelihood generation for local communities will be the major focus. The conservation practices as prescribed in the Working Plan of the respective Territorial Forest Division

			and Wildlife Management Plan of protected area will be applicable. The State's policy on medicinal plants would regulate the collection of medicinal and aromatic plant species in protected areas in accordance with the rights of local communities. Under this model, medicinal plant species will be planted at the rate of 2,400 plants/ha in the blank areas. Root slips/ seeds of native grasses will be put in continuous contour strips immediately after melting of snow in 600/ha patches. Two years nursery period is required for high altitude medicinal plants and third year planting will be done along with grasses. Followed by two years of maintenance phase. 3rd year onwards harvesting can be started in sustainable manner.
2	**RV/JK/NL/02**	**Sub-Alpine Enrichment**	The Sub-alpine zone occurs between 2,900 - 3,600 m amsl in the Ravi Riverscape of Jammu Region J&K UT and is covered with snow for 4-5 months. The temperature remains below 5° C for around 4 months in a year. Vegetation in sub-alpine zone is dominated by herbs, grasses and shrubs of *Rhododendron* spp., etc. Area is slopy and generally soil depth is very low. Under this model, it is proposed to conserve and augment vegetation in sub-alpine zone by adopting specific interventions to enrich such areas. The major focus will be on conservation and enrichment of native species besides generation of sustainable livelihoods for local communities. Conservation and enrichment practices as prescribed in the Working Plan of respective territorial Forest division/wildlife Management Plan of a protected area will be applicable. The collection of medicinal and aromatic plant species would be regulated as per the UT policy on medicinal plants and accordingly the accrued benefit will be shared with local communities. In this model, native trees @ 200 plants/ha at 6 m x 8 m spacing and medicinal plant species @ 800 plants/ha at 6 m x 8 m spacing in 200/ha patches will be planted in blank areas. The high altitude tree species as well as high altitude temperate medicinal plants require around 2 years nursery period and planting will be done in the 3rd year. The plants will be maintained in the field during 4^{th}, 5^{th}, 6^{th} and 7^{th} year of project implementation.
3	**RV/JK/NL/03**	**Temperate Conifer Forest**	The moist temperate area lies between 1,700 - 3,500 m amsl. This zone is characterized by dense forests, mainly of conifer species. However, blank patches too occur at several places which will be taken up for proposed treatment. In some areas, especially in fir and spruce forests, soil is covered with a thick layer of humus as the decomposition rate is very slow in these areas. The suggested treatment model for these areas is being referred as the Temperate Conifer Forest Model. Planting of 300/ha plants of various tree species and 300/ha shrub species will be carried out per ha. In addition, 300/ha patches of medicinal plants with 1200 plants/ha will also be planted out in the treatment site. The small stream or *nallah* facing side of the treatment area will be planted with two rows

			of hill bamboo at 2 m x 2 m spacing with 200/ha plants of hill bamboo. The major focus will be on the conservation and development of native species and livelihood generation for local communities. The collection of medicinal and aromatic plants species in protected areas would be regulated as per the UT policy on medicinal plants and in accordance with the rights of local communities. Most of conifer plants require around 3 years of nursery period and planting will be done in the 4th year. For producing quality nursery stock of desired species, native zone soil will be used in conifer species and VAM will be added in shrubs and herb either species specific or as consortium To synchronize planting of trees, medicinal herbs and shrubs in 4th year, the nursery for selected herbs and shrubs will be raised 2nd year onwards. The plants will be maintained in the field during 5th, 6th and 7th year of the project implementation.
4	**RV/JK/NL/04**	**Temperate Mixed Forest**	The moist temperate forest area occurs between 1,700 - 3,500 m amsl. Dominant species of the area are *Aesculus indica*, *Quercus oblongata*, *Q. floribunda*, *Q. semecarpifolia*, *Alnus nitida*, *Acer caesium*, *A. pictum*, *A. cappadocicum*, *Ulmus wallichiana*, *Pinus wallichiana*, *Cedrus deodara*, *Picea smithiana*, *Abies pindrow*, *Abies spectabilis*, etc. Sometime, one species may occur in form of pure stands. This zone is often characterized by degraded stretches along the river banks running close to the area of dense temperate forests, mainly of conifers. This zone experiences snowfall and rainfall several times during winter months and enjoys a cool climate with plenty of monsoon rains. Annual precipitation in this zone is between 1,000 - 1,500 mm. In some areas, snow lasts till spring season. The soil in many places is shallow, exposed and prone to erosion. This zone is heavily grazed by domestic animals and cause huge damage to the vegetation. Besides this, road construction and other developmental activities also cause severe soil erosion, resulting in damage to vegetation. There is heavy dependence of local communities on Oak fodder within Ravi Riverscape. Further, owing to several famous tourist spots *viz*., Sarthal, etc. and the enhanced tourism activities in such fragile zone within the riverscape cause damage to vegetation and disturbance to wild fauna. Temperate mixed forest treatment model has been proposed specifically for the blank and degraded patches within the temperate zone. Planting of trees @300/ha belonging to conifers and broadleaved species will be carried out in the blank and degraded patches. In this model preferably broadleaved plant will be planted in general and conifer plants can be planted on the ridges and shallow soil depth area. The native shrubs @300 plants/ha will be carried out in between the tree planted. The medicinal plants species will also be planted in patches @ 4 plants/ patch and that means planting of total of 1,200 medicinal plants/ ha. The small stream or *nallah* facing side of the treatment site will be planted with two rows of hill bamboo @ 200/ha at 2 m x 2 m spacing. The

			major focus of the proposed treatment model will be on the conservation and propagation of native species alongside improved livelihoods for local communities. Most of conifer plants require around 3 years of nursery period and planting will be done in the 4th year. For producing quality nursery stock of desired species, native zone soil will be used in conifer species and VAM will be added in shrubs and herb either species specific or as consortium. To synchronize planting of trees, medicinal herbs and shrubs in 4th year, the nursery for selected herbs and shrubs will be raised 2nd year onwards. The plants will be maintained in the field during 5th, 6th and 7th year of the project implementation. The collection of medicinal and aromatic plant species in protected areas would be regulated as per the UT policy on medicinal plants and in accordance with the rights of local communities.
5	**RV/JK/NL/05**	**Pasture and Grazing Land Development**	These areas are located between 600 - 3,200 m amsl, particularly on southern slopes and around habitations are characterized by pasture and grazing lands. This zone experiences snowfall and rainfall several times during winter months and enjoys a cool climate with plenty of monsoon rains. Annual precipitation is around 1,200 - 1,600 mm. In some areas, snow lasts till spring season. The soil is shallow, exposed and prone to erosion, particularly in moderate to steep slopes. This zone is heavily grazed by livestock and cause huge damage to the vegetation and results into heavy soil erosion.Besides disturbance by livestock, road construction and other developmental activities also cause significant soil degradation and damage to native flora by proliferation of invasive alien species. The local communities are heavily dependent on these grasslands in the Ravi Riverscape. This zone also severely suffers on account of enhanced tourism activities in several popular tourist destinations *viz*., Sarthal, Bani, Kathua, etc. causing damage to flora and disturbance to fauna. Under this model, pasture and grazing land development are proposed by protection, development and enrichment of areas within this zone. Suitable grass species will be planted/ sowing of seeds after carrying out necessary land development works like trenching/ terracing/ moisture conservation measures, etc. besides removal of weeds and unpalatable grasses. The proposed treatment model mainly includes plantation of native and nutritionally important grass species. In this model, grass sowing in furrows/ strips of 100 cm x 30 cm x 5 cm along contours at interval of 2 m apart is proposed. Selected species will be raised / maintained in the nursery during 1st year and planting will be done in the second year. The grasses will be replenished in the field during 3rd and 4th year.
6	**RV/JK/NL/06**	**Himalayan Chir Pine Forest**	In this zone of Jammu region, J&K UT particularly on southern aspect, Chir pine is the dominant species. The altitude ranges between 800 - 1,800 m amsl and annual rainfall varies from 1,200 - 1,800 mm. In these areas, high

			temperatures and humidity conditions prevail during summer. Ground is densely covered with pine needles during winter to summer season and such areas are prone to forest fires. Grasses flush during monsoon season. Heavy rains in monsoon lead into severe soil erosion in this zone, ultimately results into high rate of sedimentation in Ravi River and its tributaries. This is one of the major causes of siltation of dams and floods in Punjab plains. Open and degraded forests on southern aspect with sparse vegetation coupled with agriculture on steep slopes, construction and developmental activities are prominent reasons behind large scale soil erosion in this zone. These areas experience heavy rainfall during monsoon season and modest rainfall during the winter season. Snowfall occurs in cooler aspects of higher reaches, but the snow stays for a few days only. Most of the rainwater flows down the streams washing away top soil especially on slopy sites. The soil is acidic in nature and shallow on steep slopes while valleys have deep soil. The biotic pressure in terms of livestock grazing, and fuel wood and tree fodder collection is conspicuous. Suitable forestry interventions in this zone can immensely help in improvement of pastures and grazing lands besides checking soil erosion and siltation into Ravi River and its tributaries. For such areas in this zone, the Himalayan Chir Pine Forest Model is proposed. Grass species such as *Heteropogon contortus, Chrysopogon fulvus*, etc. are proposed to be sown in the treatment site, particularly towards the river or *nallah* side. The area will be planted with *Pinus roxburghii* mainly in drier sites with shallow soil depth whereas broadleaved species like *Quercus oblongata, Lyonia ovalifolia*, Bamboo spp., etc. on moist sites are proposed to be planted at 5 m x 5 m spacing. A total of 300 plants of tree/ha, 100 bamboo species /ha along with 300 plants of shrubs/ha and 800 patches of grasses will be planted 2m apart in staggered fashion. Chir pine and associated broadleaved species require around 2 years nursery period and planting will be done in the 3rd year. For producing quality nursery stock of desired species, native zone soil will be used in conifer species and VAM will be added in shrubs and herbs either species specific or as consortium. The plants will be maintained in the field during 4th, 5th and 6th years. The fire line of width 5m both side along the fencing of the plantation area be maintained twice a year.
7	**RV/JK/NL/07**	**Himalayan Mixed Forest**	This zone occurs in mid hill region on the northern aspect and is dominated by broadleaved species with some Chir pine in exposed areas. The altitudinal variation in this zone is between 800 –1,800 m amsl and the zone receives annual rainfall ranging between 1,000 - 1,500 mm. The zone experiences high temperatures and humidity prevails during the summer season. In areas wherein Chir pine species is around 50%, the ground is mostly covered with pine needles and area is prone to forest fires. Grasses in slopes flush during the monsoon season. Heavy rains in the monsoon season cause severe soil erosion and sedimentation in Ravi River and its tributaries.

			Moderately dense to open forests on the northern aspect coupled with agriculture on terraces along moderately steep slopes, and construction and development activities are primary reasons for large scale soil erosion in this zone. These areas experience heavy rainfall during the monsoon season and modest rainfall during the winter season. Snowfall occurs on cooler aspects of higher reaches but the snow stays for a short duration of few days. Most of the rainwater flows down the streams washing away top soil especially on slopy sites. The soil is neutral to acidic in nature and shallow on slopes while valleys have deep soils. The biotic pressure i.e., livestock grazing, and collection of fuel wood and tree fodder is severe. Appropriate forestry interventions in this zone can immensely help in improvement of the zone and also river flow. The Himalayan Mixed Forest Model is recommended for this zone. Grass species such as *Heteropogon contortus*, *Chrysopogon fulvus*, *C. serrulatus*, etc. will be sown or planted in the part of treatment site, particularly on the ridges. The treatment area will be planted with broadleaved species like *Quercus oblongata*, *Lyonia ovalifolia*, *Toona ciliata*, *Syzygium cumini*, *Grewia optiva*, *Pyrus pashia*, *Albizia* spp., *Phyllanthus emblica*, *Holoptelea integrifolia*, *Ficus* spp., *Punica granatum*, *Bauhinia variegata*, etc. Plants will be planted at 5 m x 5 m spacing. A total of 300 plants of tree/ha, 300 plants of shrubs/ha and 200 patches of 2x2 m apart grasses on the ridges/degraded sites will be planted. Broad leaved species of this zone require around one and half year to two years of nursery period and planting will be done in the 3rd year. For producing quality nursery stock of desired species VAM will be added either species specific or as consortium. The plants will be maintained in the 4th to 6th years. The fire line of width 5m both side along the fencing of the plantation area be maintained twice a year.
8	**RV/JK/NL/08**	**Sub-Tropical Dry Deciduous Forest**	This zone occurs in foot hills of Jammu Region, J&K UT and dominated by broadleaved deciduous species. The altitude ranges between 300 - 900 m amsl and the zone experiences annual rainfall varying from 1,000 - 1,300 mm. Several broadleaved species grow in this zone which shed their leaves during summer months. The zone is represented by deep soil and moderate slope and experiences heavy rainfall during the monsoon season and modest rainfall during the winter season. Heavy rains during the monsoon season transport silt from these areas through number of seasonal water channels, *nallahs*, rivulets, etc. to the Ravi River causing siltation in dams and floods in downstream areas. Besides this, agriculture on slopes and construction and developmental activities are the main reasons for soil erosion from these areas. A large part of rainwater flows down the streams within a few hours of rainfall as surface runoff. The soil is shallow on slopes while valleys have deep soil depth. The biotic pressure (i.e., livestock grazing, fuel wood and tree fodder collection) is significant in this zone. Appropriate forestry interventions in

			this zone would not only check soil erosion and improve vegetation but would also help in improvement in the e-flow of the Ravi River and its tributaries. The Sub-Tropical Dry Deciduous Forest Model is recommended in this zone. Under this model, it is proposed to plant 300 trees of broadleaved species or bamboos. 300 shrubs at 5 m x 5 m will be planted in between the tree rows. Strong soil binding grasses like *Arundinella nepalensis*, *Apluda mutica*, *Chrysopogon fulvus* and sedges like *Carex obscura* will be planted on the river or nallah facing side of the treatment site. In case of trees, a mixture of timber species like *Dalbergia sissoo*, *Senegalia catechu*, *Adina cordifolia*, etc. along with medicinal trees like *Terminalia* spp., *Phyllanthus emblica*, *Oroxylum indicum*, *Sapindus mukorossi*, etc. will be planted at 5 m x 5 m spacing. Management practices and conservation measures as prescribed in the Working Plan of the respective territorial forest division or the wildlife management plan of the protected area will be applicable. Collection of medicinal plants and other NTFP's along with sharing of accrued benefits to local communities would be regulated as per the UT policy on medicinal plants. Nursery of selected trees and shrubs, etc. will be established during 1st year and 2nd year and planting will be done in 3rd year. For producing quality nursery stock of desired species VAM will be added either species specific or as consortium. Subsequently, the plantation will be managed during next three years. The fire line of width 5m both side along the fencing of the plantation area be maintained twice a year.
9	**RV/JK/NL/09**	**Eradication of *Lantana* (> 50%)**	Invasive and alien species are plants those hamper regeneration and growth of native species, thereby replacement of native plant species coupled with loss of biodiversity, forage, habitat, aesthetics and productivity of native species. Owing to considerable area of this zone under the influence of *Lantana*, tangible and intangible benefits from lower temperate to sub- tropical forests within the Ravi Riverscape have been adversely affected. The area for the proposed model referred as 'Eradication of *Lantana* (>50%)' covers forest sites between around 300 - 1,200 m amsl wherein the topography is with gentle slopes. Such areas have sub-tropical to lower-temperate climate with around 1,000 - 1,300 mm annual rainfall. Soils are generally fertile and moderately deep. The proposed treatment area for this model usually has open or moderately dense forest or scrub vegetation. Luxuriant growth of *Lantana camara* forms dense undergrowth in the forest suppressing the native vegetation of that area. It is proposed to cut and manually uproot above stated invasive species in treatment sites as per the prescription of CRS (Cut Root Stock) method for complete eradication of this

			obnoxious weed. These areas after Lantana removal will be planted in the third year of project implementation. Grass species such as *Heteropogon contortus*, *Chrysopogon fulvus*, etc. will be sown in the part of treatment site. The treatment area will be planted with broadleaved species like *Toona ciliata*, *Syzygium cumini*, *Grewia optiva*, *Pyrus pashia*, *Albizia* spp., *Phyllanthus emblica*, *Holoptelea integrifolia*, *Ficus* spp., *Punica granatum*, *Bauhinia variegata*, *Dendrocalamus strictus*, *D. hamiltonii*, *Bambusa bambos*, *B. arundinacea*, etc. Plants will be planted at 5 m x 5 m spacing. A total of 600 plants of tree species/ha., 600 patches of 4 m x 4 m apart grasses on sites will be planted. Broadleaved species of this zone require around one and half year of nursery period and planting will be done in the 3rd year. The plants will be maintained in the 4th to 7th years.
10	**RV/JK/NL/10**	**Control/ Removal of Invasive Species or <50% *Lantana***	Invasive and alien species are plants those hamper regeneration and growth of native species, thereby replacement of native plant species coupled with loss of biodiversity, forage, habitat, aesthetics and productivity of native species. Owing to considerable area of this zone under the influence of invasive alien or weed species, tangible and intangible benefits from lower temperate to sub- tropical forests within the Ravi Riverscape have been adversely affected. The area for the proposed model referred as 'Control/ Removal of Invasive Species' covers forest sites between around 300 - 1,200 m amsl wherein the topography is with gentle slopes. Such areas have sub-tropical to lower-temperate climate with 1,000 - 1,500 mm annual rainfall. Soils are generally fertile and moderately deep. The proposed treatment area for this model usually has open or moderately dense forest or scrub vegetation. Luxuriant growth of weed species including *Lantana camara* (<50%) forms considerably dense undergrowth in the forest suppressing the native vegetation of that area. *Ageratum conyzoides* and *Parthenium hysterophorus* also cause considerable hazard especially near agriculture fields and settlements. It is proposed to cut and manually uproot above stated invasive species in treatment sites prior to their flowering, and immediately to be followed by planting of native plant species. In case of *Lantana* infested areas, CRS (Cut Root Stock) method will be used for complete eradication/ control of this obnoxious weed. In case of other weeds, cutting and removal of infested plants will be done at such a time and such a way as to cause least disturbance to soil and provide opportunity to the nearby economically important plants to occupy the space vacated by weeds. These areas after plantation will be intensively managed subsequently for two years to minimize the chances of their re-growth. For

			controlling herbaceous weeds like *Ageratum conyzoides* and *Parthenium hysterophorus*, eco-friendly measures (e.g., physical or mechanical methods, use of natural products, etc.) will be adopted without resorting to the use of synthetic chemicals. These areas after *Lantana* removal will be planted in the third year of project implementation. Grass species such as *Heteropogon contortus*, *Chrysopogon fulvus*, etc. will be sown in the part of treatment site. The treatment area will be planted with broadleaved species like *Quercus oblongata*, *Toona ciliata*, *Syzygium cumini*, *Grewia optiva*, *Pyrus pashia*, *Albizia* spp., *Phyllanthus emblica*, *Holoptelea integrifolia*, *Ficus* spp., *Punica granatum*, *Bauhinia variegata*, *Dendrocalamus strictus*, *D. hamiltonii*, *Bambusa bambos*, *B. arundinacea*, etc. Plants will be planted at 5 m x 5 m spacing. A total of 400 plants of tree species/ha, 400 patches of 5 m x5 m apart grasses on sites will be planted. The rows of trees and grasses will be planted alternatively. Broadleaved species of this zone require around one and half year of nursery period and planting will be done in the 3rd year. The plants will be maintained in the 4th to 7th years.
11	**RV/JK/NL/11**	**Protection Model for Natural Regeneration**	All the hill areas between 800 - 4,100 m amsl is characterized by dense forests, mainly conifers and Oak forests, sub-alpine vegetation i.e., herbs, grasses, shrubs and scattered small trees and alpine pastures. However, blank patches too occur at several locations that can be taken up for the proposed treatment. In selected areas, especially in Deodar, Blue pine, Fir, Spruce, Oaks forests and even the sub-alpine and alpine areas, adequate regeneration can be observed under favorable conditions. Owing to varied disturbances by human and livestock in such areas, establishment of natural regeneration is generally poor and need immediate attention. Often, a thick layer of humus is typically present and the soil is generally moist and conducive for natural regeneration. Under this treatment model, it is proposed to protect and conserve vegetation so as to promote ample establishment and recruitment of natural regeneration. The major focus will be on protection of special areas like patches of good natural regeneration of various conifers, broadleaved species shrubs, etc. and thereby conserving native plant species, particularly herbs. In natural regeneration areas cleaning operation twice a year in the month of September and March be carried out *viz.*, climber cutting, removal of obnoxious weeds, unwanted species and pruning of plants. The broadcasting of desired seed to be done in the closed area to supplement the natural regeneration.
12	**RV/JK/NL/12**	**Fire Protection Model**	This zone occurs in sub-tropical i.e., from foot hills to mid hill of Jammu Region, J&K UT. It is dominated by Chir pine in southern aspects and mixed vegetation in other aspects. The altitude is 800 - 1800 m amsl and annual rainfall is 1,200 - 1,

			800 mm and mostly during monsoon and some portion in winter months. This zone experiences 7-8 dry months every year making these forests highly vulnerable to fires. Even a small negligence during dry months in Chir pine dominated areas carries the great risk of igniting forest fires that spread very fast riding on the wind. Damage caused by the forest fires in Jammu region is immense with loss to regeneration, pole crop, productivity, ecosystem services, wildlife, etc. Heavy monsoon rains in the burnt out areas transport huge quantities of silt to Ravi River carrying siltation to dams and causing floods in Punjab plains. Effective fire control measures can help significantly in reducing the silt load in Ravi River and its tributaries. For these fire prone forest area, a 'Fire Protection Model' is proposed. In this model, existing fire lines are proposed to be cleared of vegetation and maintained all around the forest in such a way that a compact block or area is separated from adjoining areas. These fire lines are usually cleared before the start of the fire seasons in order to avoid the spread of fires from one forest to another. Engagement of fire watchers in fire sensitive beats, procurement of firefighting equipments including use of elide fire extinguishing balls, construction of water harvesting and storage structure using locally available materials in the middle of fire sensitive zones *e.g.*, ponds, *Khal*, etc. Besides these, awareness campaign among rural masses particularly about overall damage by forest fires to native flora and fauna, soil and other ecosystem services of the forest such as hydrological functions, moderation of local climate etc. influencing horticulture/ agriculture productivity of farmlands will be organized. Role of local communities in bringing down the forest fire incidences in Chir-pine zone is very important and need to be highlighted at various levels.
13	**RV/JK/NL/13**	Plantation by Eco Task Force in Temperate Forests	Some sites in the upper Ravi River Basin have rugged topography, harsh conditions, shallow soils with low moisture content, etc. Such areas are mostly located on the southern slopes. These sites require continued presence and close supervision by planting and maintenance teams. The Eco-Task Force (ETF) in the past has exhibited great success in regeneration of such harsh sites. It is proposed to utilize this unique ability of ETF in planting on such difficult sites under this DPR. The task of establishment and maintenance of proposed plantations will be carried out by the raising one more unit under this DPR to be established in Basohli area of J&K UT. The unit will work in close coordination with Jammu and Kashmir Forest Department. One or more of the proposed plantation models amongst suggested models (RV/JK/NL/01 to RV/JK/NL/10) will be selected for replication by the ETF under this model.

Table 2.17 - Species suggested for plantation in NL in J&K UT

Sr. No.	Model No.	Suggestive species
1	RV/JK/NL/01	**Herbs/Medicinal Plants:** *Delphinium cashmerianum, Hypericum cernuum, Aconitum heterophyllum, Aconitum violaceum, Ainsliaea aptera, Arnebia benthamii, Dactylorhiza hatagirea, Heracleum candicans, Polygonatum verticillatum, P. multiflorum, Fritillaria roylei, Picrorhiza kurroa, Selinum tenuifolium, Allium humile, Geranium wallichianum, Rheum australe, Rheum moorcroftianum* and *Sinopodophyllum hexandrum.* **Grasses and Forbs:** *Festuca pratensis, F. valesiaca, Trifolium pratense, Poa pratensis, Poa alpina, Dactylis glomerata, Agrostis gigantea, A. pilosula, sphaeralcea munroana, Danthonia* spp. *Calamagrostis montanensis, Koeleria* spp., *Brachypodium sylvaticum, Bromus himalaicus, B. ramosus, Stipa roylei*, etc.
2	RV/JK/NL/02	**Trees:** *Betula utilis, Pinus wallichiana, Acer caesium, Corylus jacquemontii, Prunus cornuta, Quercus semecarpifolia,* etc. **Herbs/Medicinal Plants:** *Saussurea costus, Aconitum heterophyllum, Arnebia benthamii, Dactylorhiza hatagirea, Heracleum candicans, Polygonatum verticillatum, Selinum tenuifolium, Allium humile, Geranium wallichianum, Bergenia stracheyi, Phytolacca acinosa, Hyoscyamus niger, Angelica glauca, Picrorhiza kurroa, Fritillaria roylei, Sinopodophyllum hexandrum, Trillium govanianum,*etc.
3	RV/JK/NL/03	**Trees:** *Cedrus deodara, Pinus wallichiana, Picea smithiana, Taxus wallichiana, Cupressus torulosa*, etc. **Shrubs:** *Drepanostachyum falcatum, Thamnocalamus spathiflorus, Daphne papyracea, Prinsepia utilis, Rosa* spp., *Debregeasia hypoleuca, Cotoneaster bacillaris, Viburnum* spp., *Cornus oblonga, Syringa emodi, Indigofera heterantha, Desmodium elegans, Hypericum oblongifolium, Sarcococca saligna,* etc. **Herbs:** *Aconitum heterophyllum, Picrorhiza kurroa, Heracleum candicans, Angelica glauca, Geranium wallichianum, Polygonatum* spp., *Bergenia ciliata, Viola canescens, Trillium govanianum, Phytolacca acinosa, Valeriana jatamansi, Hedychium spicatum, Sinopodophyllum hexandrum, Thymus linearis, Achillea millefolium,* etc.
4	RV/JK/NL/04	**Trees:** *Cedrus deodara, Pinus wallichiana, Picea smithiana, Taxus wallichiana, Aesculus indica, Juglans regia, Prunus cornuta, P. cerasoides, Acer* spp., *Carpinus viminea, Betula alnoides, Cornus macrophylla, C. capitata, Alnus nitida, Ulmus wallichiana, Quercus oblongata, Q. floribunda, Q. semecarpifolia, Neolitsea pallens, Lyonia ovalifolia,* etc. **Shrubs:** *Drepanostachyum falcatum, Thamnocalamus spathiflorus, Daphne papyracea, Prinsepia utilis, Rosa* spp., *Debregeasia hypoleuca, Cotoneaster bacillaris, Viburnum spp., Elaeagnus conferta,*

		Hypericum oblongifolium, Rubus spp., *Zanthoxylum armatum, Deutzia* spp., *Spiraea canescens, Berberis* spp., *Desmodium elegans, Indigofera heterantha*, etc. **Herbs:** *Aconitum heterophyllum, Heracleum candicans, Angelica glauca, Geranium wallichianum, Polygonatum verticillatum, P. cirrhifolium, Sinopodophyllum hexandrum, Bergenia ciliata, Viola serpens, V. canescens, Valeriana jatamansi, Hedychium spicatum, Trillium govanianum, Ajuga* spp., *Achillea millefolium, Swertia angustifolia, S.cordata, S. paniculata*, etc.
5	**RV/JK/NL/05**	**Grasses and Herbs:** *Festuca pratensis, Trifolium pratense, T. repens, Poa pratensis, Poa annua, Dactylis glomerata, Erianthus* spp., *Agrostis* spp., *Agropyron* spp. *Calamagrostis* spp., *Koeleria* spp., *Saccharum spontaneum, Chrysopogon gryllus, Arundinella nepalensis, A.pumila, Themeda anathera, Cymbopogon distans, Setaria glauca, Alopecurus aequalis, A. nepalensis, Bothriochloa pertusa, B. parviflora*, etc.
6	**RV/JK/NL/06**	**Tree:** *Pinus roxburghii, Quercus oblongata, Lyonia ovalifolia, Dendrocalamus strictus, Dendrocalamus hamiltonii, Holoptelea integrifolia, Ficus* spp., *Termilalia* spp., *Albizia* spp., *Phyllanthus emblica, Diospyros* spp., *Bauhinia variegata, Grewia optiva, Pyrus pashia, Mallotus philippinensis, Aegle marmelos, Bombax ceiba, Senegalia catechu, Dalbergia sissoo, Pistacia integerrima, Cinnamomum tamala, etc.* **Shrubs:** *Justicia adhatoda, Myrsine africana, Murraya koenigii, Murraya paniculata, Ricinus communis, Tinospora cordifolia, Woodfordia fruticosa, Maesa indica, Nyctanthes arbor-tristis, Vitex negundo, Carissa opaca, Berberis lycium, Ziziphus nummularia, Ziziphus jujuba, Desmodium* spp., *Tephrosia hamiltonii, Indigofera* spp. **Grasses and Forbs:** *Heteropogon contortus, Chrysopogon fulvus, C. serrulatus, Boerhavia diffusa, Festuca pratensis, Festuca arundinacea, Poa pratensis, Erianthus filifolius, Erianthus rufipilus, Agrostis gigantea, Agropyron* spp., *Phleum pratense, Themeda anathera, Arundo donax, Cymbopogon martinii, Phragmites karka, Bothriochloa pertusa, B. intermedia, Eulaliopsis binata, Calamagrostis* spp., *Thysanolaena maxima*, etc.
7	**RV/JK/NL/07**	**Trees:** *Quercus oblongata, Lyonia ovalifolia, Holoptelea integrifolia, Ficus* spp., *Albizia* spp., *Phyllanthus emblica, Bauhinia variegata, Grewia optiva, Pyrus pashia, Toona ciliata, Syzygium cumini, Punica granatum, Pistacia integerrima, Bombax ceiba, Cinnamomum tamala, Anogeissus* spp., *Terminalia* spp., *Senegalia catechu, Dalbergia sissoo*, etc. **Shrubs:** *Rosa* spp., *Debregeasia hypoleuca, Elaeagnus conferta, Zanthoxylum armatum, Deutzia staminea, D. corymbosa, Berberis lycium, Ziziphus* spp., *Carissa opaca, Murraya* spp., *Desmodium gangeticum, Tephrosia hamiltonii, Justicia adhatoda, Ricinus communis, Tinospora cordifolia, Woodfordia fruticosa, Maesa indica,*

		Nyctanthes arbor-tristis, Vitex negundo, etc. **Grasses and Forbs:** *Heteropogon contortus, Chrysopogon fulvus, C. serrulatus, Boerhaavia diffusa, Festuca pratensis, Festuca arundinacea, Poa pratensis, Erianthus filifolius, Erianthus rufipilus, Agrostis gigantea, Agropyron* spp., *Phleum pratense, Themeda anathera, Arundo donax, Cymbopogon martinii, Phragmites karka, Bothriochloa pertusa, B. intermedia, Eulaliopsis binata, Calamagrostis* spp., *Thysanolaena maxima,* etc.
8	**RV/JK/NL/08**	**Trees:** *Dalbergia sissoo, Senegalia catechu, Adina cordifolia, Aegle marmelos, Terminalia* spp., *Mallotus philippinensis, Syzygium cumini, Oroxylum indicum, Sapindus mukorossi, Dendrocalamus* spp., *Bambusa* spp., *Holoptelea integrifolia., Ficus* spp., *Albizia* spp., *Celtis australis, Litsea chinensis, Alstonia scholaris, Phyllanthus emblica, Diospyros* spp., *Cinnamomum tamala, Bauhinia variegata, Grewia optiva, Cassia fistula, Anogeissus* spp., etc. **Shrubs:** *Rosa* spp., *Debregeasia hypoleuca, Zanthoxylum armatum, Myrsine africana, Deutzia staminea, D.corymbosa, Ziziphus* spp., *Carissa opaca, Desmodium gangeticum, Tephrosia hamiltonii, Justicia adhatoda, Murraya* spp., *Ricinus communis, Tinospora cordifolia, Woodfordia fruticosa, Maesa indica, Nyctanthes arbor-tristis, Vitex negundo, Thysanolaena maxima,* etc. **Grasses/Forbs:***Heteropogon contortus, Chrysopogon fulvus, C. serrulatus, Boerhaavia diffusa, Festuca pratensis, Festuca arundinacea, Poa pratensis, Erianthus filifolius, Erianthus rufipilus, Agrostis gigantea, Agropyron* spp., *Phleum pratense, Themeda anathera, Arundo donax, Cymbopogon martinii, Phragmites karka, Bothriochloa pertusa, B. intermedia, Eulaliopsis binata, Calamagrostis* spp., etc.
9	**RV/JK/NL/09**	**Trees:** *Dalbergia sissoo, Senegalia catechu, Adina cordifolia, Aegle marmelos, Terminalia* spp., *Mallotus philippensis, Syzygium cumini, Oroxylum indicum, Sapindus mukorossi, Dendrocalamus* spp., *Bambusa* spp., *Holoptelea integrifolia, Ficus* spp., *Albizia* spp., *Celtis australis, Litsea chinensis, Pyrus pashia, Alstonia scholaris, Phyllanthus emblica, Diospyros* spp., *Bauhinia variegata, Grewia optiva, Pyrus pashia, Anogeissus* spp., *Bombax ceiba,* etc. **Grasses/Forbs:** *Arundinella nepalensis, Apluda mutica, Chrysopogon fulvus, Boerhavia diffusa, Heteropogon contortus, Trifolium repens, Eragrostis nigra, Deschampsia* spp., *Panicum maximum, Phleum pratense, Cymbopogon citrullus, Arundo donax, Phragmites karka, Themeda arundinacea, Eulaliopsis binata, Dichanthium annulatum, Sporobolus diander, Thysanolaena maxima, Hierochloe laxa,* etc.
10	**RV/JK/NL/10**	**Trees:** *Dalbergia sissoo, Senegalia catechu, Adina cordifolia, Aegle marmelos, Terminalia* spp., *Mallotus philippensis, Syzygium cumini, Oroxylum indicum, Sapindus mukorossi, Dendrocalamus* spp., *Bambusa* spp., *Holoptelea integrifolia, Ficus* spp., *Albizia* spp., *Celtis australis, Litsea chinensis, Pyrus pashia, Alstonia scholaris,*

		Phyllanthus emblica, *Diospyros* spp., *Bauhinia variegata*, *Grewia optiva*, *Pyrus pashia*, *Anogeissus* spp., *Bombax ceiba*, etc. **Grasses/Forbs:** *Arundinella nepalensis*, *Apluda mutica*, *Chrysopogon fulvus*, *Boerhavia diffusa*, *Heteropogon contortus*, *Trifolium repens*, *Eragrostis nigra*, *Deschampsia spp.*, *Panicum maximum*, *Phleum pratense*, *Cymbopogon citrullus*, *Arundo donax*, *Phragmites karka*, *Themeda arundinacea*, *Eulaliopsis binata*, *Dichanthium annulatum*, *Sporobolus diander*, *Thysanolaena maxima*, *Hierochloe laxa*, etc.
11	**RV/JK/NL/11**	No Plantation proposed
12	**RV/JK/NL/12**	----
13	**RV/JK/NL/13**	----

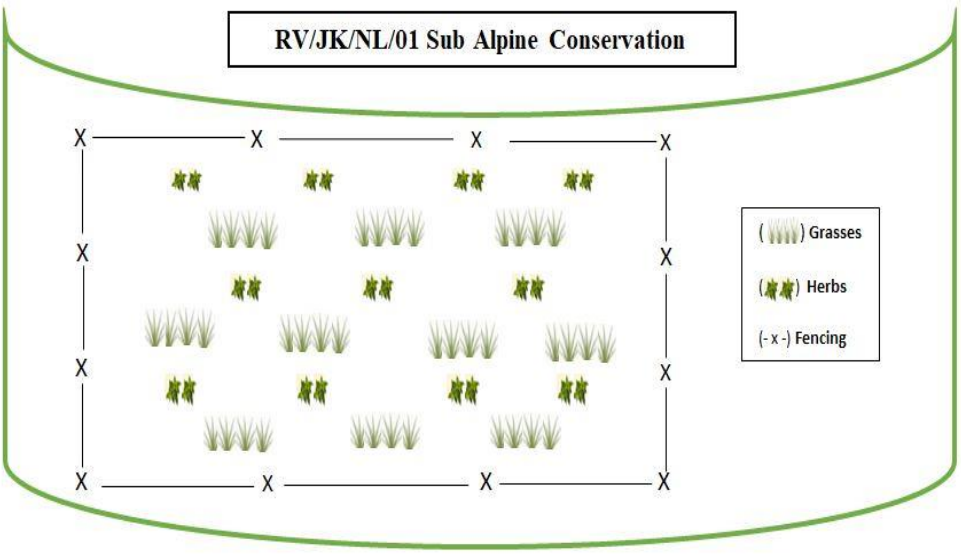


Fig. 2.21 – RV/JK/NL/01 Sub-Alpine Conservation

RV/JK/NL/01 Herbs: Patch number - 600, Patch size (cm) - 30 x 30 x 5. Spacing (m) - 2 x 8, Plant per patch - 4, Spacing (cm) – 20 x 20 (planting in 3rd Year)

Grasses: Patch number - 600, Patch size (cm) – 100 x 30 x 5. Spacing (m) – 2 x 8, Seed per patch (gm) – 6gm, Spacing (cm) – 10 x 10

Fencing: Cement pole/local material - wood/branches

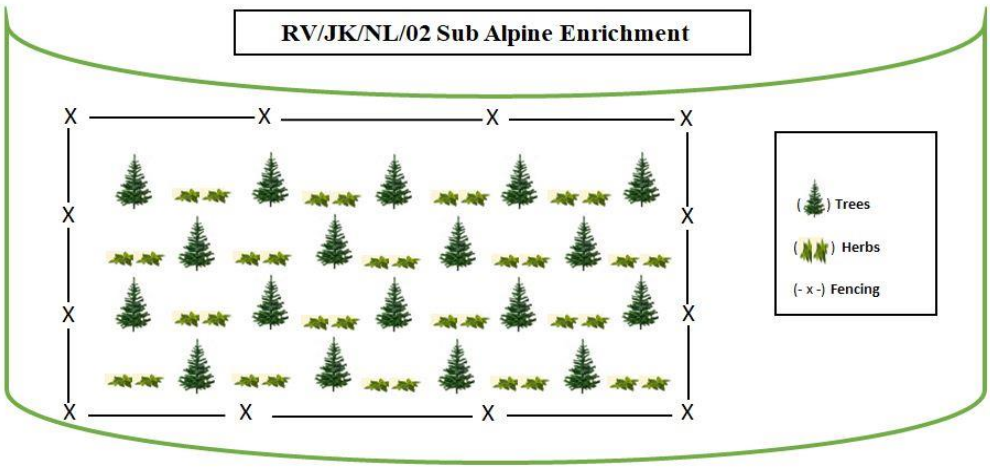


Fig. 2.22 – RV/JK/NL/02 Sub-Alpine Enrichment

RV/JK/NL/02 Trees: Plants- 200 No./ha., Spacing (m) - 6 x 8, Pit size (cm) – 30 x 30 x 30

Herbs: Plants- 800/ha, Patch no. – 200/ha, Patch size (cm) - 30 x 30 x 5. Spacing (m) - 6 x 8, plant per patch - 4, Spacing (cm) – 20 x 20

Fencing: Cement pole/local material- wood/branches

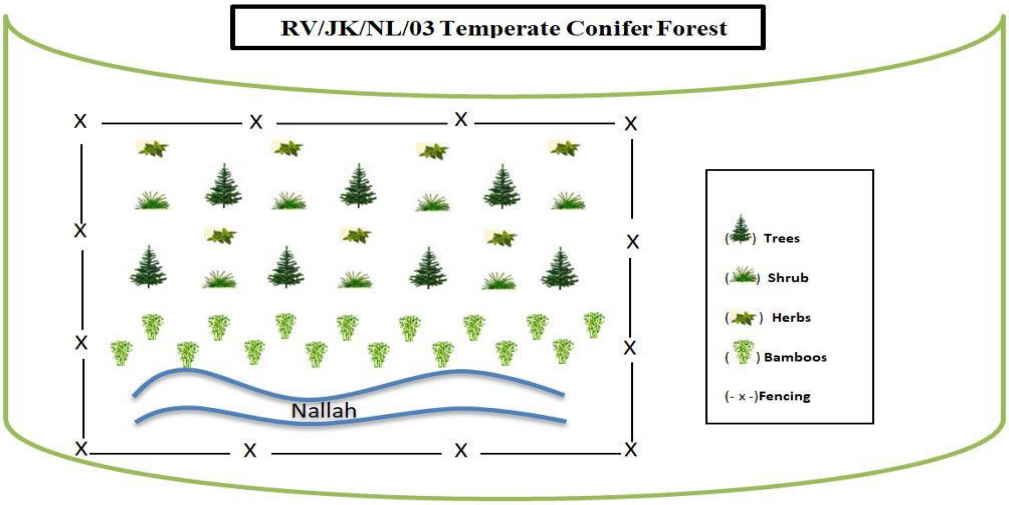


Fig. 2.23 – RV/JK/NL/03 Temperate Conifer Forest

Trees: 400 No./ha, Spacing (m) – 5 x 5, Pit size (cm) – 45 x 45 x 45

Bamboo (hill): 200/ha, Spacing (m)-5 x 5, Pit size (cm) – 45 x 45 x 45 (along *Nallah*)

Shrubs: Plants- 400/ha., No. of Pit - 400, Spacing (m) - 5 x 5, Pit size (cm) – 30 x 30 x 30 (gap filling)

Herbs: Plants- 1600/ha, Patch no – 400/ha, Patch size (cm) - 30 x 30 x 5. Spacing (m) – 5 x 5, plant per patch - 4, Spacing (cm) – 20 x 20

Fencing: Cement pole/local material wood/branches

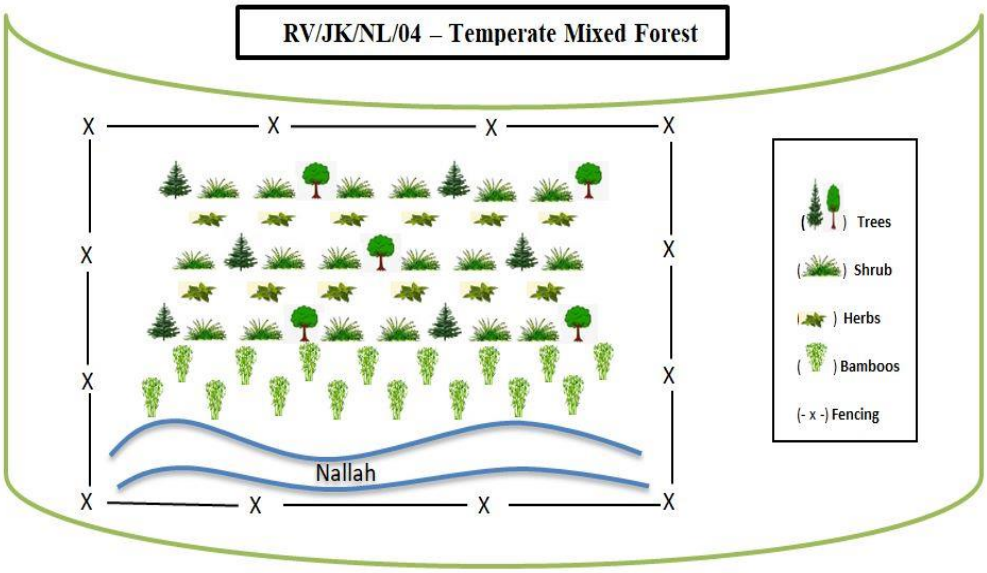


Fig. 2.24 – RV/JK/NL/04 – Temperate Mixed Forest

RV/JK/NL/04 Trees: 400 No., Spacing (m) - 5 x 5, Pit size (cm) – 45 x 45 x 45 (50;50 of B/L & Conifer)

Bamboo (hill): 200, Spacing (m) -5 x 5, Pit size (cm) – 45 x 45 x 45 (along *Nallah*)

Shrubs: Plants: 400 no., No. of Pit - 400, Spacing (m) - 2 x 5, Pit size (cm) – 30 x 30 x 30

Herbs: Plants: 1600 Patch no – 400, Patch size (cm) - 30 x 30 x 5. Spacing (m) - 3 x 5, plant per patch - 4, Spacing (cm) - 20 x 20

Fencing: Cement pole/ local material- wood/ branches

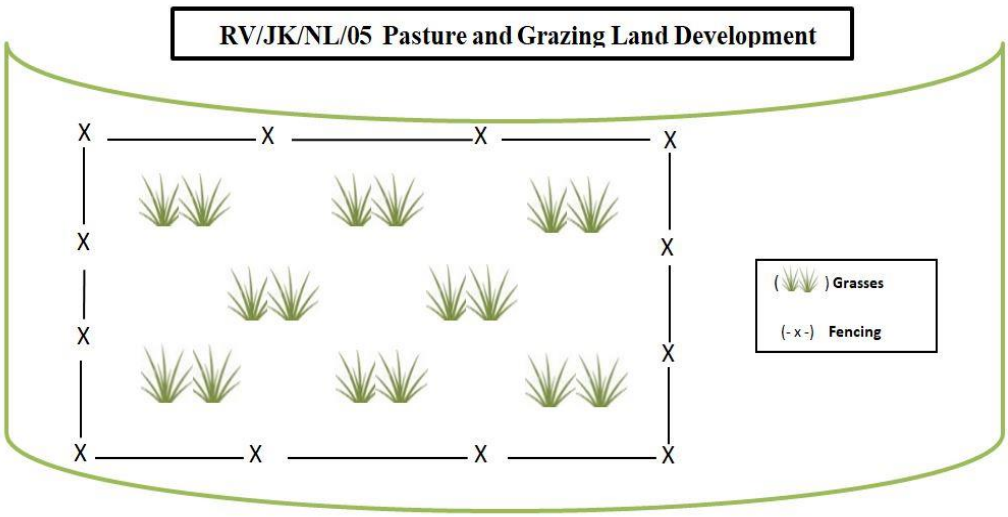


Fig. 2.25 – RV/JK/NL/05 – Pasture and Grazing Land Development

RV/JK/NL/05 Grasses: Patch no. -2000, Patch size (cm) – 100 x 30 x 5. Spacing (m) – 2 x 2, Seed per patch (gm) - 6, Spacing (cm) – 10 x 10, Type - Staggered

Fencing: Cement pole/ local material-wood/ branches/ brushwood fencing

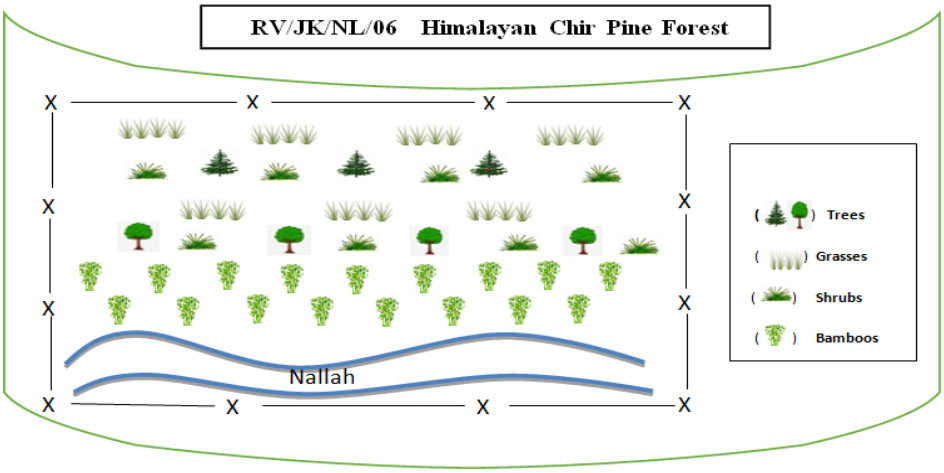


Fig. 2.26 – RV/JK/NL/06 Himalyan Chir Pine Forest

RV/JK/NL/06 Trees: 300 No., Spacing (m) - 5 x 5, Pit size (cm) – 45 x 45 x 45

Bamboo : 100, Spacing (m) - 3 x 3, Pit size (cm) – 45 x 45 x 45 along *Nallah* (if available)

Shrubs: Plants: 400 no., No. of Pit - 400, Spacing (m) - 5 x 5, Pit size (cm) – 30 x 30 x 30

Grasses: Patch no - 800, Patch size (cm) – 100 x 30 x 5. Spacing (m) – 2 x 5, Seed per patch (gm) - 6, Spacing (cm) - 10 x 10, Type – Staggered

Fencing: Cement pole/ local material-wood/ branches /brushwood fencing

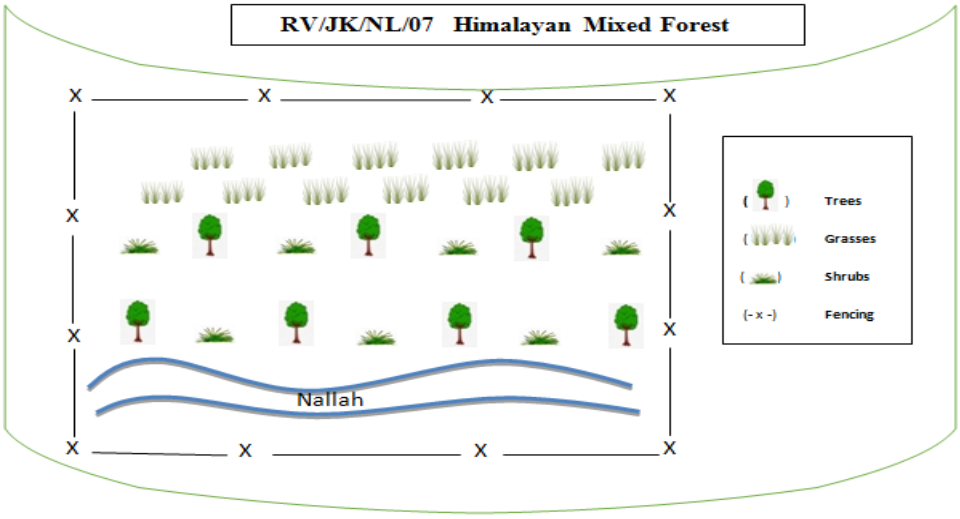


Fig. 2.27 – RV/JK/NL/07 Himalayan Mixed Forest

RV/JK/NL/07 Trees: 400 No., Spacing (m) – 5 x 5, Pit size (cm) – 45 x 45 x 45

Shrubs: 400 no., spacing (m) – 5 x 5, Pit size (cm) – 30 x 30 x 5.

Grasses: Patch number – 200, Patch size (cm) – 100 x 30 x 5. Spacing (m) – 2 x 2, Seed per patch (gm) – 6, Spacing (cm) – 10 x 10, Type –Staggered,

Fencing: Cement pole/ local material-wood/ branches /brushwood fencing

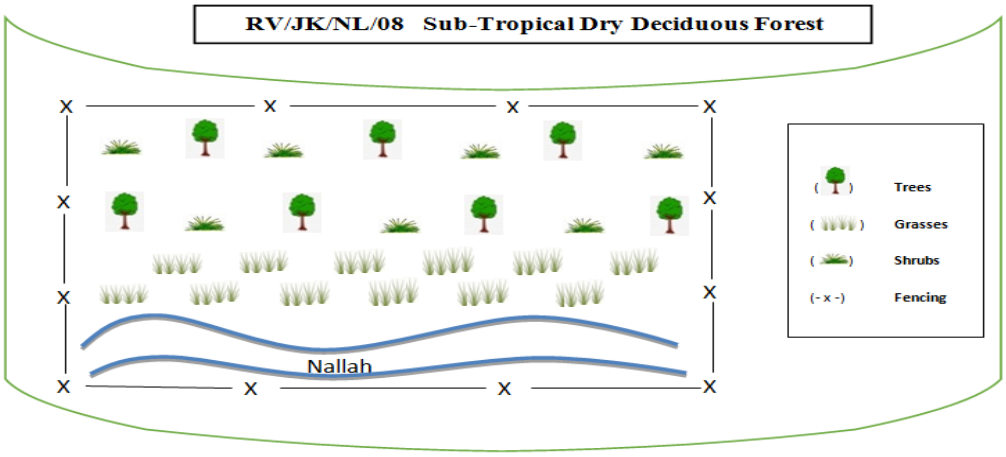


Fig. 2.28 – RV/JK/NL/08 Sub-Tropical Dry Deciduous Forest

RV/JK/NL/08 Trees: 400 No., Spacing (m) - 5 x 5, Pit size (cm) – 45 x 45 x 45

Shrubs: 400 no., spacing (m) - 5 x 5, Pit size (cm) – 30 x 30 x 30

Grasses: Patch no - 200, Patch size (cm) - 100 x 30 x 5. Spacing (m) - 2 x 2, Seed per patch (gm) - 6, seed, Spacing (cm) - 10 x 10, Type –Staggered, along *Nallah*/depressions(if available)

Fencing: Cement pole/ local material-wood/ branches /brushwood fencing

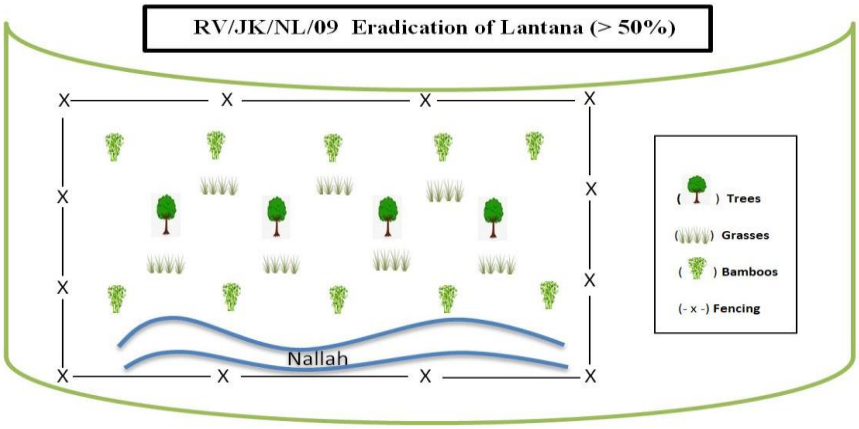


Fig. 2.29 – RV/JK/NL/09 Eradication of *Lantana* (>50%)

RV/JK/NL/09 Trees/Bamboo: 600 No., Spacing (m) - 4 x 4, Pit size (cm) – 45 x 45 x 45

Grasses: Patch no - 600, Patch size (cm) - 100 x 30 x 5. Spacing (m) - 4 x 4, Seed per patch (gm) – 6gm, Spacing (cm) - 10 x 10, Type –Staggered

Fencing: Cement pole/ local material-wood/ branches/brushwood fencing

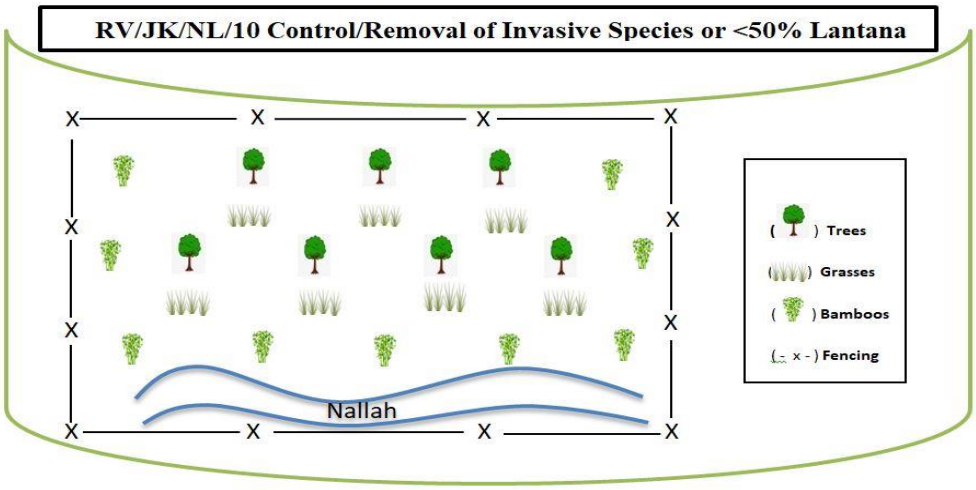


Fig. 2.30 – RV/JK/NL/10 Control/Removal of Invasive Species or <50% *Lantana*

RV/JK/NL/10 Trees/Bamboo: 400 No., Spacing (m) - 5 x 5, Pit size (cm) – 45 x 45 x 45

Grasses: Patch no - 400, Patch size (cm) - 100 x 30 x 5. Spacing (m) - 5 x 5, Seed per patch (gm) - 6, seed, Spacing (cm) - 10 x 10, Type –Staggered

Fencing: Cement pole/ local material-wood/ branches/brushwood fencing

Table 2.18 - Cost Norms for RV/JK/NL/01 (Alpine Conservation)

Year	Item	Detail of work	Amount/ Ha (Rs)	Tentative Man days
1st Year	No of Plants (No.)	2400 Herbs, 600 Grass Patches.	3,600	
	N1- Advance Work Labour Cost	Raising of Nursery including maintenance in Ist year.	12,000	53
2nd year	A!- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants and raising of plants for Ist year maintenance (30%).	8,089	34

	A1-Advance Work Labour Cost	Site preparation- Site preparation i/c survey & demarcation, Cutting grubbing and removal of *Lantana* or other bushes, preparation inspection path, Carriage of fence post and PCC poles, Digging of holes and Fixing for poles, Stretching & fixing of Barbed wire at spacing 20cm and 4 strands, Barbered wire and Cement Concrete (PCC) poles / Angle Iron Pole.	124589	518
3rd year	C- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants, plants for Ist year maintenance (30%) and raising of plants for 2nd year maintenance (25%).	11,403	44
	C- Creation	Carriage of plants, Lay out patches, Patches & Planting of herbs and Preparation of strips including (i/c) sowing of grasses in strips.	9,617	37
Total Establishment Cost (Rs.) =			**165,698**	**686**
Maintenance				
4th year	Maintenance Cost - I Year	Maintenance of Nursery including maintenance of plants for Ist year maintenance(30%), 2nd year maintenance(25%) and rising of plants for 3rd year maintenance (15%), Carriage of plants, Pitting & Planting of plants & Planting of herbs, sowing of grasses , Watch and ward i/c repair of fencing, Weeding and mulching.	9,261	34
5th year	Maintenance Cost - II Year	Maintenance of Nursery including 2nd year maintenance (25%) and 3rd year maintenance (15%) Carriage of plants, Pitting & Planting of plants & Planting of herbs, sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching.	5,741	19
6th year	Maintenance Cost - III Year	Maintenance of Nursery including maintenance of 3rd year maintenance, Carriage of plants, Pitting & Planting of plants & Planting of herbs, Watch and ward i/c repair of fencing, Weeding and mulching.	2,777	9
7th year	Maintenance Cost - IV Year	Watch and ward i/c repair of fencing.	12155	36
Total Maintenance Cost (Rs.) =			**29,934**	**98**
Total cost of plantation (Rs.) =			**195,632**	**784**

Table 2.19 - Cost Norms for RV/JK/NL/02 Sub Alpine Enrichment

Year	Item	Detail of work	Amount/ ha (Rs.)	Tentative Man days
	No of Plants (No.)	200 Plants, 800 Herbs.		
1st Year	N1- Advance Work Labour Cost	Raising of Nursery including maintenance in Ist year.	6,400	28
2nd year	A1- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants and raising of plants for Ist year maintenance (30%).	4,920	20
2nd year	A1-Advance Work Labour Cost	Site preparation- Site preparation i/c survey & demarcation, Cutting grubbing and removal of *Lantana* or other bushes, preparation inspection path, Carriage of fence post and PCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire at spacing 20cm and 4 strands, Barbed wire and Cement Concrete (PCC) poles / Angle Iron Pole.	124589	554
3rd year	C- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants, plants for Ist year maintenance (30%) and raising of plants for 2nd year maintenance (25%).	5,610	22
	C- Creation	Carriage of plants, Lay out patches, Patches & Planting of herbs and Preparation of strips including (i/c) sowing of grasses in strips.	1,603	6
		Carriage of Plants, Lay out pit, digging & filling of pit, Planting of plants and shrubs in pits.	6,718	26
Total Establishment Cost (Rs.) =			**149,840**	**656**
Maintenance				
4th year	Maintenance Cost - I Year	Maintenance of Nursery including Maintenance of plants for Ist year Maintenance (30%), 2nd year maintenance(25%) and raising of plants for 3rd year maintenance (15%), Carriage of plants, Pitting & Planting of plants & Planting of herbs, sowing of grasses , Watch and ward i/c repair of fencing, Weeding and mulching.	15,571	56
5th year	Maintenance Cost - II Year	Maintenance of Nursery including 2nd year maintenance (25%) and 3rd year maintenance, (15%) Carriage of Plants, Pitting & Planting of Plants & Planting of Herbs, sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching.	14,375	49
6th year	Maintenance Cost - III Year	Maintenance of Nursery including maintenance of 3rd year maintenance., Carriage of plants, Pitting & Planting of plants & Planting of herbs, Watch and ward i/c repair of fencing, Weeding and mulching.	13,395	42

7th year	Maintenance Cost - IV Year	Watch and ward i/c repair of fencing.	12155.9158	36
Total Maintenance Cost (Rs.) =			**55,497**	**183**
Total cost of plantation (Rs.) =			**2,05,337**	**839**

Table 2.20 - Cost Norms for RV/JK/NL/03 – Temperate Conifer Forest

Year	Item	Detail of work	Amount/Ha (Rs)	Tentative Man days
	No of Plants (No.)	800 Plants, 1200 Herbs.		
1st Year	N1- Advance Work Labour Cost	Raising of Nursery including maintenance in Ist year.	18,800	84
2nd year	A1- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants and raising of plants for Ist year maintenance (30%).	14,060	58
2nd year	A1-Advance Work Labour Cost	Site preparation- Site preparation i/c survey & demarcation, Cutting grubbing and removal of *Lantana* or other bushes, preparation inspection path, Carriage of fence post and PCC poles, Digging of holes and Fixing for poles, Stretching & fixing of Barbed wire at spacing 20cm and 4 strands, Barbered wire and Cement Concrete (PCC) poles / Angle Iron Pole.	124589	518
3rd year	C- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants, plants for Ist year maintenance (30%) and raising of plants for 2nd year maintenance (25%).	15,742	61
	C- Creation	Carriage of plants, Lay out patches, Patches & Planting of herbs and Preparation of strips including (i/c) sowing of grasses in strips.	3,206	12
		Carriage of plants Lay out pit, digging & refilling of pit, Planting of plants and shrubs in pits.	30,232	117
Total Establishment Cost (Rs.) =			**206,629**	**850**
Maintenance				
4th year	Maintenance Cost - I Year	Maintenance of Nursery including maintenance of plants for Ist year maintenance (30%), 2nd year maintenance(25%) and raising of plants for 3rd year maintenance(15%), Carriage of plants, Pitting & Planting of plants & Planting of herbs, sowing of grasses , Watch and ward i/c repair of fencing, Weeding and mulching.	28,907	105

5th year	Maintenance Cost - II Year	Maintenance of Nursery including 2nd year maintenance (25%) and 3rd year maintenance, (15%) Carriage of plants, Pitting & Planting of plants & Planting of herbs, sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching.	23,891	81
6th year	Maintenance Cost - III Year	Maintenance of Nursery including maintenance of 3rd year maintenance, Carriage of plants, Pitting & Planting of plants & Planting of herbs, Watch and ward i/c repair of fencing, Weeding and mulching.	18,936	60
7th year	Maintenance Cost - IV Year	Watch and ward i/c repair of fencing.	12156	36
Total Maintenance Cost (Rs.) =			**83,890**	**282**
Total cost of plantation (Rs.) =			**2,90,519**	**1,132**

Table 2.21 - Cost Norms for RV/JK/NL/04 – Temperate Mixed Forest

Year	Item	Detail of work	Amount/Ha (Rs.)	Tentative Man days
	No of Plants (No.)	800 Plants, 1200 Herbs.		
1st Year	N1- Advance Work Labour Cost	Raising of Nursery including maintenance in Ist year.	21,500	96
2nd year	A1- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants and raising of plants for Ist year maintenance (30%).	15,890	66
		Site preparation-Site preparation i/c survey & demarcation, Cutting grubbing and removal of *Lantana* or other bushes, preparation inspection path, Carriage of fence post and PCC poles, Digging of holes and Fixing of poles, Stretching & fixing of B/wire at spacing 20cm and 4 strands, Barbed wire and Cement Concrete (PCC) poles / Angle Iron Pole.	124589	518
3rd year	C- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants, plants for Ist year maintenance (30%) and raising of plants for 2nd year maintenance (25%).	16,824	65
	C- Creation	Carriage of plants, Lay out patches, Patches & Planting of herbs, and Preparation of strips including (i/c) sowing of grasses in strips.	3,206	12
		Carriage of plants Lay out pit, digging & refilling of pit, and Planting of plants and shrubs in pits.	30,232	117
Total Establishment Cost (Rs.) =			**212,241**	**874**

Maintenance				
4th year	Maintenance Cost - I Year	Maintenance of Nursery including maintenance of plants for Ist year maintenance (30%), 2nd year maintenance(25%) and raising of plants for 3rd year maintenance(15%), Carriage of plants, Pitting & Planting of plants & Planting of herbs, sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching.	29,679	108
5th year	Maintenance Cost - II Year	Maintenance of Nursery including 2nd year maintenance. (25%) and 3rd year maintenance, (15%) Carriage of plants, Pitting & Planting of plants & Planting of herbs, sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching.	24,068	82
6th year	Maintenance Cost - III Year	Maintenance of Nursery including maintenance of 3rd year maintenance., Carriage of plants, Pitting & Planting of plants & Planting of herbs, Watch and ward i/c repair of fencing, Weeding and mulching.	18,936	60
7th year	Maintenance Cost - IV Year	Watch and ward i/c repair of fencing.	12156	36
Total Maintenance Cost (Rs.) =			**84,839**	**286**
Total cost of plantation (Rs.) =			2,97,080	**1160**

Table 2.22 - Cost Norms for RV/JK/NL/05 - Pasture and Grazing Land

Year	Item	Detail of work	Amount/Ha (Rs)	Tentative Man days
	No of Plants (No.)	2000 Grass Patches.	12,000	
1st year	N1- Advance Work Labour Cost	Raising of Nursery including maintenance in Ist year.	0	0
2nd year	A1- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants and raising of plants for Ist year maintenance (30%).	0	
		Site preparation- Site preparation i/c survey & demarcation, Cutting grubbing and removal of *Lantana* or other bushes, preparation of inspection path, Carriage of fence post and PCC poles, Digging of holes and Fixing for poles, Stretching & fixing of Barbed wire at spacing 20cm and 4 strands, Barbed wire and Cement Concrete (PCC) poles / Angle Iron Pole.	124589	554
3rd year	C- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants, plants for Ist year maintenance (30%) and raising of plants for 2nd year maintenance (25%).	0	0

	C- Creation	Carriage of plants, Lay out patches, Patches & Planting of herbs and Preparation of strips including (i/c) sowing of grasses in strips.	16,029	62
		Carriage of plants, Lay out pit, digging & refilling of pit and Planting of plants and shrubs in pits.	0	0
Total Establishment Cost (Rs.) =			**1,40,618**	**616**
Maintenance				
4th year	Maintenance Cost - I Year	Maintenance of Nursery including maintenance of plants for Ist year maintenance (30%), 2nd year maintenance(25%) and raising of plants for 3rd year maintenance (15%), Carriage of plants, Pitting & Planting of plants & Planting of herbs, sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching.	15,068	55
5th year	Maintenance Cost - II Year	Maintenance of Nursery including 2nd year maintenance (25%) and 3rd year maintenance, (15%) Carriage of plants, Pitting & Planting of plants & Planting of herbs, sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching.	15,205	52
6th year	Maintenance Cost - III Year	Maintenance of Nursery including maintenance of 3rd year maintenance, Carriage of plants, Pitting & Planting of plants & Planting of herbs, Watch and ward i/c repair of fencing, Weeding and mulching.	14,306	45
7th year	Maintenance Cost - IV Year	Watch and ward i/c repair of fencing.	12156	36
Total Maintenance Cost (Rs.) =			**56,735**	**188**
Total cost of plantation (Rs.) =			**1,97,353**	**804**

Table 2.23 - Cost Norms for RV/JK/NL/06 Himalayan Chir Pine Forest

Year	Item	Detail of work	Amount/Ha (Rs)	Tentative Man days
	No of Plants (No.)	700 Plants and 800 Grass Patches.	4,800	
1st Year	N1- Advance Work Labour Cost	Raising of Nursery including maintenance in Ist year.	12,000	53
2nd year	A1- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants and raising of plants for Ist year maintenance (30%).	6,800	28

2nd year	A1-Advance Work Labour Cost	Site preparation- Site preparation i/c survey & demarcation, Cutting grubbing and removal of *Lantana* or other bushes, preparation inspection path, Carriage of fence post and PCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire at spacing 20cm and 4 strands, Barbed wire and Cement Concrete (PCC) poles / Angle Iron Pole.	124589	554
3rd year	C- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants, plants for Ist year maintenance (30%) and raising of plants for 2nd year maintenance (25%).	7,160	32
	C- Creation	Carriage of plants Lay out patches, Patches & Planting of herbs and Preparation of strips including (i/c) sowing of grasses in strips.	6,411	25
		Carriage of plants Lay out pit, digging & refilling of pit, Planting of plants and shrubs in pits.	23,472	104
Total Establishment Cost (Rs.) =			**180,432**	**768**
Maintenance				
4th year	Maintenance Cost - I Year	Maintenance of Nursery including maintenance of plants for Ist year maintenance (30%), 2nd year maintenance(25%) and raising of plants for 3rd year maintenance(15%), Carriage of plants, Pitting & Planting of plants & Planting of herbs, sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching.	24,968	91
5th year	Maintenance Cost - II Year	Maintenance of Nursery including 2nd year maintenance (25%) and 3rd year maintenance, (15%) Carriage of plants, Pitting & Planting of plants & Planting of herbs, sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching.	21,822	74
6th year	Maintenance Cost - III Year	Maintenance of Nursery including maintenance of 3rd year maintenance, Carriage of Plants, Pitting & Planting of plants & Planting of herbs, Watch and ward i/c repair of fencing, Weeding and mulching	18,150	58
7th year	Maintenance Cost - IV Year	Watch and ward i/c repair of fencing.	12156	36
Total Maintenance Cost (Rs.) =			**77,096**	**259**
Total cost of plantation (Rs.) =			**257,528**	**1027**

Table 2.24 - Cost Norms for RV/JK/NL/07 Himalayan Mixed Forest

Year	Item	Detail of work	Amount/Ha (Rs)	Tentative Man days
	No of Plants (No.)	600 Plants , 200 Grass Patches.	1,200	
1st Year	N1- Advance Work Labour Cost	Raising of Nursery including maintenance in Ist year.	12,000	53
2nd year	A1- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants and raising of plants for Ist year maintenance (30%).	6,800	28
		Site preparation- Site preparation i/c survey & demarcation, Cutting grubbing and removal of *Lantana* or other bushes, preparation of inspection path, Carriage of fence post and PCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire at spacing 20cm and 4 strands, Barbed wire and Cement Concrete (PCC) poles / Angle Iron Pole.	124589	554
3rd year	C- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants, plants for Ist year maintenance (30%) and raising of plants for 2nd year maintenance (25%).	7,160	32
	C- Creation	Carriage of plants, Lay out patches, Patches & Planting of herbs and Preparation of strips including (i/c) sowing of grasses in strips.	1,603	6
		Carriage of plants Lay out pits, digging & refilling of pits, Planting of plants and shrubs in pits.	23,472	104
Total Establishment Cost (Rs.) =			**175,624**	**777**
Maintenance				
4th year	Maintenance Cost - I Year	Maintenance of Nursery including maintenance of plants for Ist year maintenance (30%), 2nd year maintenance(25%) and raising of plants for 3rd year maintenance(15%), Carriage of plants, Pitting & Planting of plants & Planting of herbs, sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching.	23,425	85
5th year	Maintenance Cost - II Year	Maintenance of Nursery including 2nd year maintenance (25%) and 3rd year maintenance, (15%) Carriage of plants,	20,446	69

		Pitting & Planting of plants & Planting of herbs, sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching.		
6th year	Maintenance Cost - III Year	Maintenance of Nursery including maintenance of 3rd year maintenance, Carriage of plants, Pitting & Planting of plants & Planting of herbs, Watch and ward i/c repair of fencing, Weeding and mulching.	17,267	55
7th year	Maintenance Cost - IV Year	Watch and ward i/c repair of fencing.	12156	36
Total Maintenance Cost (Rs.) =			**73,294**	**245**
Total cost of plantation (Rs.) =			**248,918**	**1022**

Table 2.25 - Cost Norms for RV/JK/NL/08 - Sub-Tropical Dry Deciduous Forest

Year	Item	Detail of work	Amount/Ha (Rs)	Tentative Man days
	No of Plants (No.)	800 Plants, 200 Grass Patches.	1,200	
1st Year	N1- Advance Work Labour Cost	Raising of Nursery including maintenance in Ist year.	12,000	53
2nd year	A1-Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants and raising of plants for Ist year maintenance (30%).	6,800	
		Site preparation Site preparation i/c survey & demarcation, Cutting grubbing and removal of *Lantana* or other bushes, preparation inspection path, Carriage of fence post and PCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire at spacing 20cm and 4 strands, Barbed wire and Cement Concrete (PCC) poles / Angle Iron Pole.	124589	554
3rd year	C- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants, plants for Ist year maintenance (30%) and raising of plants for 2nd year maintenance (25%).	7,160	32
	C- Creation	Carriage of plants, Lay out patches, Patches & Planting of herbs and Preparation of strips including (i/c) sowing of grasses in strips.	1,603	6
		Carriage of plants Lay out pit, digging & refilling of pit and Planting of plants and shrubs in pits.	23,472	104
Total Establishment Cost (Rs.) =			**175,624**	**749**

Maintenance				
4th year	Maintenance Cost - I Year	Maintenance of Nursery including maintenance of plants for Ist year maintenance (30%), 2nd year maintenance (25%) and raising of plants for 3rd year maintenance (15%), Carriage of plants, Pitting & Planting of plants & Planting of herbs, Sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching.	23,425	85
5th year	Maintenance Cost - II Year	Maintenance of Nursery including 2nd year maintenance (25%) and 3rd year maintenance, (15%) Carriage of Plants, Pitting & plant of plants & Planting of herbs, Sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching.	20,446	69
6th year	Maintenance Cost - III Year	Maintenance of Nursery including maintenance of 3rd year maintenance, Carriage of plants, Pitting & Planting of pants & Planting of herbs, Watch and ward i/c repair of fencing, Weeding and mulching.	17,267	55
7th year	Maintenance Cost - IV Year	Watch and ward i/c repair of fencing.	12156	36
Total Maintenance Cost (Rs.) =			**73,294**	**245**
Total cost of plantation (Rs.) =			**248,918**	**994**

Table 2.26 - Cost Norms for RV/JK/NL/09 – Eradication of *Lantana* (> 50%)

Year	Item	Detail of work	Amount/Ha (Rs.)	Tentative Man days
	No of Plants (No.)	600 Plants, 600 Grass Patches.	3,600	
1st Year	N1- Advance Work Labour Cost	Raising of Nursery including maintenance in Ist year.	9,000	40
	N1-Ad work	Site Preparation includes *Lantana* by Cut Root Stock method and Cleaning of *Lantana* (sprouts) and seedlings, one times in Ist year.	26,340	109
2nd year		Maintenance of Nursery including maintenance of Ist year plants and raising of plants for Ist year maintenance (30%).	5,457	23

	A1- Advance Work Labour Cost	Cleaning of *Lantana*(sprouts) and seedlings,3 times a year @ 15% of unit cost (estb.), Preparation inspection path, Carriage of fence post and PCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire at spacing 20cm and 4 strands, Barbed wire and Cement Concrete (PCC) poles / Angle Iron Pole.	111110	462
3rd year	C- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants, plants for Ist year maintenance (30%) and raising of plants for 2nd year maintenance (25%).	6,148	24
	C- Lantana Cutting	Cleaning of *Lantana*(sprouts) and seedlings,3 times a year @ 15% of unit cost (establishment)	11,800	46
	C- Creation	Carriage of plants, Lay out patches, Patches & Planting of herbs and preparation of strips including (i/c) Sowing of grasses in strips.	4,809	19
		Carriage of plants, Lay out pits, digging & refilling of pits, and Planting of plants and shrubs in pits.	17,604	78
Total Establishment Cost (Rs.) =			**192,268**	**801**
Maintenance				
4th year	Maintenance Cost - I Year	Maintenance of Nursery including maintenance of plants for Ist year maintenance (30%), 2nd year maintenance(25%) and raising of plants for 3rd year maintenance (15%), Carriage of plants, Pitting &Planting of plants & Planting of herbs, Sowing of grasses, Watch and ward i/c repair of fencing, Weeding, mulching, and Cleaning of *Lantana*(sprouts) and seedlings,3 times a year.	21,207	77
5th year	Maintenance Cost - II Year	Maintenance of Nursery including 2nd year maintenance (25%) and 3rd year maintenance, (15%) Carriage of plants, Pitting & Planting of plants & Planting of herbs, Sowing of grasses, Watch and ward i/c repair of fencing, Weeding, mulching, Cleaning of *Lantana*(sprouts) and seedlings, 2 times a year.	19,021	64
6th year	Maintenance Cost - III Year	Maintenance of Nursery including maintenance of 3rd year maintenance, Carriage of plants, Pitting & Planting of plants & Planting of herbs, Watch and ward i/c repair of fencing, Weeding and mulching.	16,453	52
7th	Maintenance Cost -	Watch and ward i/c, repair of fencing,	12156	36

year	IV Year	Cleaning of *Lantana* (sprouts) and seedlings, 2 times a year.		
Total Maintenance Cost (Rs.) =			**68,837**	**229**
Grand Total (Rs.) =			**2,64,704**	**1030**

Table 2.27 - Cost Norms for RV/JK/NL/10 – Control/ Removal of Invasive Species or <50% *Lantana*

Year	Item	Detail of work	Amount/Ha (Rs.)	Tentative Man days
	No of Plants (No.)	400 Plants, 400 Grass Patches.	2,400	
1st Year	N1- Advance Work Labour Cost	Raising of Nursery including maintenance in Ist year.	6,000	27
	N1-Ad work	Site preparation includes *Lantana* by Cut Root Stock method and Cleaning of *Lantana* (sprouts) and seedlings, one times in Ist year.	26,340	109
2nd year	A1- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants and raising of plants for Ist year maintenance (30%).	3,638	15
2nd year	A1-Advance Work Labour Cost	Cleaning of *Lantana*(sprouts) and seedlings,3 times a year @ 15% of unit cost (establishment), preparation inspection path, Carriage of fence post and PCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire at spacing 20cm and 4 strands, Barbed wire and Cement Concrete (PCC) poles / Angle Iron Pole.	111110	462
3rd year	C- Advance Work Labour Cost	Maintenance of Nursery including maintenance of Ist year plants, plants for Ist year maintenance (30%) and raising of plants for 2nd year maintenance (25%).	4,099	16
	C- *Lantana* Cutting	Cleaning of *Lantana* (sprouts) and seedlings, 3 times a year @ 15% of unit cost (estb.).	11,800	46
	C- Creation	Carriage of plants, Lay out of patches, Patches & Planting of herbs and Preparation of strips including (i/c) Sowing of grasses in strips.	3,206	12
		Carriage of plants, Lay out pits, Digging & refilling of pits and Planting	13,437	52

		of plants and shrubs in pits.		
Total Establishment Cost (Rs.) =			**179,630**	**739**
Maintenance				
4th year	Maintenance Cost - I Year	Maintenance of Nursery including maintenance of plants for Ist year maintenance (30%), 2nd year maintenance (25%) and raising of plants for 3rd year maintenance (15%), Carriage of plants, Pitting &Planting of plants & Planting of herbs, Sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching, and Cleaning of *Lantana*(sprouts) and seedlings,3 times a year.	17,446	63
5th year	Maintenance Cost - II Year	Maintenance of Nursery including 2nd year maintenance, (25%) and 3rd year maintenance, (15%) Carriage of plants, Pitting & Planting of plants & Planting of herbs, Sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching, and Cleaning of *Lantana*(sprouts) and seedlings, 2 times a year.	16,220	55
6th year	Maintenance Cost - III Year	Maintenance of Nursery including maintenance of 3rd year maintenance, Carriage of plants, Pitting & Planting of plants & Planting of herbs, Watch and ward i/c repair of fencing, Weeding and mulching.	14,755	47
7th year	Maintenance Cost - IV Year	Watch and ward i/c, repair of fencing, Cleaning of *Lantana*(sprouts) and seedlings, 2 times a year.	12156	36
Total Maintenance Cost (Rs.) =			**60,577**	**201**
Grand Total (Rs.) =			**240,207**	**940**

Table 2.28 - Cost Norms for - RV/JK/NL/11 Protection Model for Natural Regeneration

Year	Item	Detail of work	Amount/Ha (Rs.)	Tentative Man days
	No of Plants (No.)	400 Plants, 400 Grass Patches.	2,400	

1st Year	N1- Advance Work Labour Cost	Pruning and training of existing root stocks (tending operations), Cleaning and un-saleable thinning (non-commercial) in regeneration areas, Climber cutting in the forests/ plantation area and Debris collection and burning.	1,905	8
2nd year	A1-Advance Work Labour Cost	C-Pruning and training of existing root stocks (tending operations) 300 no., preparation inspection path, Carriage of fence post and PCC poles, Digging of holes and Fixing of poles, Stretching & fixing of Barbed wire at spacing 20cm and 4 strands, Barbed wire and Cement Concrete (PCC) poles / Angle Iron Pole.	102120	424
3rd year	C- *Lantana* Cutting	Pruning and training of existing root stocks (tending operations) (150 plants), Cleaning and un-saleable thinning (non-commercial) in regeneration areas, Climber cutting in the forests/ plantation area, Debris collection and burning (15% area).	1,091	4
	C- Creation	Carriage of plants, Lay out of patches, Patches & Planting of herbs and Preparation of strips including (i/c) sowing of grasses in strips.	3,206	12
Total Establishment Cost (Rs.) =			**108,322**	**448**
Maintenance				
4th year	Maintenance Cost - I Year	Sowing of grasses, Watch and ward i/c, repair of fencing, Weeding and mulching and Cleaning of climbers, 3 times a year.	10,952	40
5th year	Maintenance Cost - II Year	Sowing of grasses, Watch and ward i/c repair of fencing, Weeding and mulching and pruning and training of existing root stocks (tending operations), 2 times a year.	11,535	39
6th year	Maintenance Cost - III Year	Watch and ward i/c repair of fencing, Weeding and mulching.	11,950	38
7th year	Maintenance Cost - IV Year	Watch and ward i/c repair of fencing, Pruning and training of existing root stocks (tending operations).	12156	36
Total maintenance cost (Rs.) =			**46593**	**153**
Grand Total (Rs.) =			**154,915**	**601**

Table 2.29 - Cost Norms for RV/JK/NL/12 Fire Protection Model

Temperate to Sub-Tropical Areas									
					1st year	2nd year	3rd year	4th year	5th year
Sr. No.	**Particulars of work to be done**	**Unit**	**Total Quantity**	**Unit Cost (Rs.)**	**Amount (Rs.)**	**Maint**	**Maint**	**Maint**	**Maint**
	Year-I								
1	Cleaning of Fire lines (10 m width) including the burning of slash debris, dry leafs, fallen branches and other inflammable material and labour charges	km	0.2	14625	2925	2925	2925	2925	2925
3	Engagement of fire watchers per 1000 ha (3 months)	ha	1	25	25	25	25	25	25
4	Constructions of Ponds/ water harvesting structures and maintenance	ha	1	10000	10000	1000	1000	1000	1000
6	Procurement of fire fighting equipment's/ Elide fire extinguishing balls and maintenance	ha	1	10000	10000	4000	3000	2000	1000
7	Awareness campaign, Community awareness	ha	1	1500	1500	1500	1500	1500	1500
Total (Rs.) =					**24450**	**9450**	**8450**	**7450**	**6450**

2.5.2 Agriculture Landscape (AL)

The proposed agricultural models will be implemented in private farmlands and community/Panchayat lands in rural areas. Availability of land will be ascertained by local officials of Forest Department based upon proposals from local farmers and communities. Plants will be supplied to farmers and local communities who will carry out planting. Maintenance cost will be given to the land owners based upon plant survival at the end of first, second, third and fourth years. Two models were proposed in agriculture landscape in Jammu & Kashmir which are described below one by one.

Treatment Models for Agriculture Landscape (AL) in Jammu & Kashmir UT

(i) Planting of Economic Trees

Model No. -RV/JK/AL/01	**Planting of Economic Trees**
Zone	**Agriculture/Horticulture land in Jammu region**

The model will be applied in agriculture fields in the plains of Jammu region. These fields are intensively cultivated for wheat, rice, sugarcane, etc. and open to soil erosion especially during flood irrigation.

Heavy monsoon rains in this zone transport huge quantities of silt to Ravi River causing siltation in dams downstream and floods in Jammu plains. Intensive cultivation in this zone makes these areas vulnerable to soil erosion. Effective forestry interventions in these sites can help significantly in improvement of the flow of Ravi River and its tributaries.

The sites proposed for this model are agricultural lands where selected clones of Poplar (*Populus deltoides*), Dek (*Melia composita*), Neem (*Azadirachta indica*), Chandan (*Santalum album*), etc., will be planted at 4 m x 4 m spacing. Pit size of 50cm x 50 cm x 40 cm will be used for plantation. Selected plants will be distributed to farmers for planting on their agricultural land. Planting will be done by the farmers. The farmers will place requirement for plants to local forest officials who will supply the plants to the farmers at the start of the planting season.

List of species for plantation

Trees : *Populus deltoides, Melia composita, Phyllanthus emblica, Aegle marmelos, Albizia* spp., *Azadirachta indica, Syzygium venosum , Gmelina arborea, Holarrhena antidysenterica, Tamarindus indica, Terminalia arjuna, Terminalia bellirica, Terminalia chebula*, etc.

Cost Sharing: The Government will share cost of planting material i.e., plant cost Rs. @ 70/- during the first year of establishment while Rs. 35/-, Rs. 35/-, Rs. 35/- during II to IV year and

maximum of 150 trees per ha. would be allowed. So cost comes out to be Rs. 10,500 per ha. for I year and for II to IV year will be Rs.5,250/ ha.

Table 2.30 - Cost Norms for RV/JK/AL/01per Hectare

Year	Amount (Rs)/ha	Man days
Ist year Establishment	9000	40
Maintenance Ist year	4815	20
Maintenance IInd year	5513	20
Maintenance IIIrd year	5899	20
	25226	**100**

(ii) Planting of Economic Trees in Block plantation

Model No. -RV/JK/AL/02	**Planting of Economic Trees in Block plantation**
Zone	**Agriculture/Horticulture Land in Jammu Region**

This model will be applied in agriculture fields in the plains of Jammu region. These fields are intensively cultivated for wheat, rice, sugarcane, etc. and open to soil erosion especially during flood irrigation.

Heavy monsoon rains in this zone transport huge quantities of silt to Ravi River causing siltation and floods in Jammu plains. Intensive cultivation in this zone makes these areas vulnerable to soil erosion. Effective forestry interventions in these sites can help significantly in improvement of the flow of Ravi River and its tributaries.

The sites proposed for this model are agricultural lands where selected tree species will be planted at 4 m x 4 m spacing – Pit size of 50 cm x 50 cm x 40 cm will be used for plantation. This is a practice of growing trees in rectangular or square planting pattern throughout the field as mostly adopted by farmers having large land holdings. Poplar (*Populus deltoides*), and Dek ((*Melia composita*) are the important tree species for block planting. Wheat, potato, mustard, berseem, turmeric, sugarcane, etc., can be profitably raised intermixed with block plantation of trees. Planting will be done by the farmers. The farmers will place requisition for plants to local forest officials who will supply the quality nursery stock to the farmers at the start of the planting season.

List of species for plantation

Trees: *Populus deltoides, Melia composita, Aegle marmelos, Azadirachta indica, Syzygium venosum, Gmelina arborea, Holarrhena antidysenterica, Santalum album, Tamarindus indica, Terminalia arjuna, Terminalia bellirica, Terminalia chebula, Phyllanthus emblica, Sapindus mukorossi*, etc.

Table 2.31 - Cost Norms and Pattern of Financial Assistance for High Density Block Plantation (HDBP)

Sr. No.	Magnitude of block Plantations (no of plants/block of 1 ha)	Total cost (Max.) (Rs) for the block ((or in proportion to planting intensity)				Total
		1st Year	2nd year	3rd Year	4th Year	
1	1200	48,000	25,680	27,478	29,401	1,30,559
2	Mandays	213	107	107	107	533

2.5.3 Urban Landscapes (UL)

(A) Treatment Models for Urban Landscapes (UL) in Jammu & Kashmir UT

(i) River Front Development

Many cities, towns and semi-urban areas are located along the Ravi River and its tributaries. Urban and peri-urban area along the river may be developed to attract residents and visitors and offer them a grand sight of the river along with fresh air, mental peace, solace and spiritual fulfilment that would connect them with the river.

River front development envisages riverbank plantation to stabilize it by protecting it from soil erosion. This involves covering the entire ground by intercepting the sunlight at various heights of canopy through multiple layers of vegetation. At the ground surface, the grasses or surface growers are allowed to cover and to bind the surface soil and control the surface soil erosion like sheet erosion, splash erosion and rill erosion. It also promotes the rain water percolation and minimize the surface runoff. At the second layer of vegetation, small to medium sized herbs and shrubs are accommodated to intercept some amount of sunlight and slow down the speed and reduce the erosive force of rain drops falling directly from sky and/or upper layers of canopy thereby reducing soil erosion (splash erosion). At the third layer of canopy above the ground surface, small to medium sized trees or larger shrubs are accommodated to provide a dense crown cover. This comprises light loving plants having good timber value and multipurpose benefits like fodder, fuelwood, etc. Scattered taller strong light demander trees may make one or two higher layers of canopy. Strong root binders are promoted on this type of site. Multi-tier planting methods are preferred. A basic support system may also be developed for the convenience of visitors.

The riverfront of Ravi and its tributaries have different owners: farmers, municipal corporations, Panchayat, irrigation department, institutions, forests departments, etc. and substantial proportion is under private ownership. Suitable steps will be taken to ensure smooth coordination of the activities among different agencies/owners

One model for riverfront development has been proposed. Site-specific activities will be carried out at different places commensurate with the local site conditions available for riverfront development. Description of the model is given below:

Model No. – RV/JK/UL/01	**Riverfront Development**
Zone	**Along the River Course or Tributaries**

The proposed model of riverfront development would involve plantation of avenue shrubs and trees along the riverbank to stabilize the soil and protect the bank from erosion. It would also have beds of annual flowering plants and patches of grasses. The area is so developed that would provide a pleasing and relaxing environment to the visitors. It would be a typical landscaping area comprised of vegetation and non-vegetation components.

According to requirements following components need to be created for riverfront development:

i. **Vegetation Part:** Grove consisting of shade trees, ornamental trees and bamboos, small herbal garden, climbers, hedges, grasses for lawn, etc.
ii. **Non-vegetation Part:** Stairs, pathways, walking trails, stone pitching, benches, rain shelters, e-public utilities, parking area, information centre, refreshment area etc. as per the site specific requirements.

The vegetation and non-vegetation components will be arranged in such a way to enhance the aesthetic beauty of Riverfront. Ornamental species will be planted according to their recommended spacing and site specific suitability.

For using the available space economically and efficiently multi-tier planting methods will be used. Soil binding and water loving ornamental tree and shrub species are ideal choice for riverbank planting. To bind the surface soil, grasses and surface growers will be allowed to cover the surface and protect soil from erosion especially during rainy season or river flooding. It will minimise soil loss through sheet erosion, splash erosion and rill erosion. It will also improve rain water per collation or absorption. Besides this, small to medium sized herbs and shrubs will be accommodated at the second layer of vegetation to intercept some amount of sunlight and stop the fast/ forceful falling of rain drops directly from sky in turn which stop soil erosion (splash erosion). Small to medium sized ornamental trees or larger shrubs i.e., mainly light demanding plants will be accommodated at the third layer of canopy to cover the crown area. This layer will provide small timber, fuel, fodder and intangible benefits. The top canopy will be occupied by the strong light demanding species which are ultimately the dominant species on riversides.

List of species for plantation

Trees: *Jacaranda mimosifolia, Grevillea robusta, Albizia chinensis, Albizia procera, Butea monosperma, Kigelia pinnata, Dalbergia sissoo, Salix alba, Saraca assoca, Polyalthia longifolia, Callistemon viminalis, Syzygium venosum*, etc.

Shrubs: *Bougainvillea* spp., *Rosa* spp., *Nerium indicum, Nyctanthes arbor-tristis, Spiraea* spp.

(ii) Institution and Industrial Estate Plantation

Model – RV/JK/UL/02	**Institution and Industrial Estate Plantation**
Zone	**Institutions and Industrial Estate**

Under this model mainly ornamental, shade and fruit plants will be encouraged for planting. Evergreen plants especially Silver oak (*Grevillea robusta*) will be preferred so that the leaves do not shed during winter months when air pollution is usually high in plains. Plantation of forest species will be raised near the vicinity of various institutions and industries at 3 m x 3 m. Pit size of 45 cm x 45 cm x 45 cm will be used for plantation. Pit size of 45 cm x 45 cm x 45 cm will be used for plantation. After land development, pit digging, etc. plants mainly of broadleaved species, *Syzygium venosum*, *Anthocephalus cadamba*, *Dalbergia sissoo*, *Melia composita*, *Pongamia pinnata*, *Holoptelea integrifolia*, *Acacia nilotica*, *Ficus rumphii*, etc. will be planted. The initiative will beautify the area, create awareness among people associated with institutions and industries and promote environmental services, besides providing economic returns from under-utilized land.

List of species for plantation

Trees: *Syzygium venosum*, *Anthocephalus cadamba*, *Dalbergia sissoo*, *Melia composita*, *Pongamia pinnata*, *Thuja* orientalis, *Cryptomeria japonica*, *Araucaria araucana*, *Holoptelea integrifolia*, *Acacia nilotica*, *Jacaranda mimosifolia*, *Grevillea robusta*, *Albizzia chinensis*, *Albizzia procera*, *Salix babylonica*, *Saraca asoca*, *Polyalthia longifolia*, *Callistemon citrinus*, *Kigelia pinnata*, *Morus alba*, etc.

(iii) Eco-Park Development

Model No. – RV/JK/UL/03	**Eco-Park Development**
Zone	**Proximity to Rivers and its Tributaries**

An Eco-Park will be better equipped than riverfront development to facilitate visitors. An Eco-Park will have both vegetation and non-vegetation components. Even in the Eco-Parks the proportion of ornamental plants will be relatively more than in the Riverfront Development Model.

According to the requirement, the list of components to be created under this model is:

i. **Vegetation Part:** Miscellaneous ornamental plant species e.g., trees, shrubs, herbs, creepers, hanging plants etc.

ii. **Non-vegetation Part:** Fencing, stairs, pathways, walking trails, stone pitching, rain shelter, e-public utilities, benches parking area, information centre, children playing area, pond beautification, landscaping, etc. as per site-specific requirements.

List of species for plantation

Trees: *Jacaranda mimosifolia*, *Grevillea robusta*, *Albizzia chinensis*, *Albizzia procera*, *Butea monosperma*, *Thuja orientalis*, *Cryptomeria japonica*, *Araucaria araucana*, *Dalbergia sissoo*, *Eucalyptus tereticornis*, *Eucalyptus camaldulensis*, *Salix alba*, *Saraca asoca*, *Polyalthia longifolia*, *Callistemon citrinus*, *Syzygium venosum*, etc.

Shrubs: *Bougainvillea* spp., *Rosa* spp., *Nerium indicum*, *Nyctanthes arbor-tristis*, *Spiraea* spp., *Euonymus* spp., etc.

Table 2.32 - Cost Norms for Treatment Models for Urban Landscape in Jammu and Kashmir UT

Sr. No	Model No.	Amount Rs/Ha	Man days	Amount Rs/Ha	Man days	Amount Rs/Ha	Man days	Amount Rs/Ha	Man days
		Estt.		1st year Maint		2nd year Maint		3rd year Maint.	
1	RV/ JK/UL/01 Riverfront Development	1,50,00,000	20,000	45,00,000	6,000	30,00,000	4,000	22,50,000	3,000
2	RV/ JK/UL/02 Institution Plantation	2,60,000	347	78,000	104	52,000	69	39,000	52
3	RV/JK/UL /03 Eco-Park Development	1,50,00,000	20,000	45,00,000	6,000	30,00,000	4,000	22,50,000	3000

2.5.4 Conservation Interventions

Three types of conservation interventions *viz*., (a) soil and water conservation, (b) riparian wildlife management, and (c) wetland management are being proposed for implementation by Jammu & Kashmir, UT level IAs. Proposed conservation interventions will be implemented at the UT and local field levels. Details of three type of conservation interventions proposed are presented below:

(A) Soil and Water Conservation Measures

The description on physical sub-environment provided earlier in the context of Ravi Riverscape has highlighted that the catchment of the river, particularly in the mountainous tract

of Himachal Pradesh and J&K UT suffers on account of landslides, bank erosion, habitat loss, construction activities and other unsustainable human activities resulting into severe problem of soil erosion and sedimentation. Accordingly, bioengineering as well as mechanical measures are envisaged for the purpose of soil and water conservation. Various models have been proposed for soil and water conservation in J&K UT which are given below in Table 2.33.

Table 2.33 - List of Models of Soil conservation Intervention

Sr. No.	Jammu and Kashmir UT
1.	RV / JK/CI/01- Brushwood Check Dam
2.	RV / JK/CI/02- Dry Stone Check Dam
3.	RV / JK/CI/03- Crate Wire Structure
4.	RV /JK/CI/04- Pond
5.	RV /JK/CI/05- Silt Detention Structure
6.	RV /JK/CI/06- Wetland Management
7.	RV /JK/CI/07- Riverine and Riparian Wildlife Management
8.	RV /JK/CI/08- Moraine Management

Table 2.34 - Cost Norms of Treatment Models for Soil and Water Conservation Interventions in Jammu region (J&K) UT

Sr. No.	Model No.	Amount Rs/ m^3	Tentative Mandays
1	RV/JK/CI/01 Brushwood Interventions	300	1
2	RV/ JK /CI /02 Dry stone activities	1800	8
3	RV/ JK /CI /03 Crate wire activities	4500	20
4	RV/JK /CI/04 Water Ponds	350	2
5	RV/JK /CI /05 Silt Detention Dam Type Activities	6000	14

Table 2.35 - Details of Activities under Riverine and Riparian Management

Sr. No	Components	Activities	Year				
			1	**2**	**3**	**4**	**5**
1	Protection	General Protection from illicit felling, illegal grazing, mining, poaching, etc.	√	√	√	√	√
		Survey and demarcation of boundaries and establishment and maintenance of permanent boundaries	√		√		√
		Physical Infrastructure (Watch Tower,	√	√	√		

Sr. No	Components	Activities	Year				
		Patrolling Path); Electric Vehicle;					
		Field Equipment - Tranquillization Gun, Night Vision with Binoculars, GPS, Surveillance equipment, Camera trap etc.	√	√	√		
		Communications equipment including laptops, Wi-Fi system etc.	√	√	√		
2	Habitat Management	Water ponds in every 2x2 km grid	√	√	√	√	
		Habitat enrichment plantations 1. Slopy area, 2. Riverine area (receded area broadcasting of lintels in strips 3. Riparian area 4. Grass land development	√	√	√	√	√
		Soil and Water Conservations Measures	√	√	√	√	√
		Control of Invasive and Alien Species	√	√	√	√	√
3	Wild Faunal Species Management	Conservative Breeding; Re-introduction of Species, etc.	√	√	√	√	√
4	Research and Development	Short Term Projects up to 1 year; Long Term Projects (5-Year)	√	√	√	√	√
		Essential Equipment and Field Infrastructure for facilitation of Research and Development and Monitoring					
5	Eco-development	Basic Infrastructure; Training to Tourist Guides of Peripheral Villages; Interpretation Centre for Nature Education	√	√	√	√	
6	Community Awareness and Participation	Creation of Self-help Groups (SHG), Provision of Revolving Fund for SHG; Alternate Income Generation Activities; Federation for Developing Entrepreneurship and Supply Management, etc.	√	√	√	√	√
7	Ecotourism	Provision of Essential Facilities; Regulation of Tourism Activities, with respect to carrying capacity of the area etc.	√	√	√	√	

Table 2.36 - Component-wise Details of Activities under Wetland Management (Natural and Artificial)

Sr. No.	Components	Activities	Year				
			1	2	3	4	5
1	Protection	General Protection from illicit felling, illegal grazing, mining, poaching, etc.	√	√	√	√	√
		Survey and demarcation of boundaries and establishment and maintenance of permanent boundaries	√		√		√
		Physical Infrastructure (Watch Tower, Patrolling Path); Electric Vehicle; Field Equipment - Tranquillization Gun, Night Vision with Binoculars, GPS, etc.	√	√	√		
		Communications	√	√	√		
2	Habitat Management	Habitat enrichment plantations 1. Sloppy area, 2. Riverine area (receded area broadcasting of lintels in strips 3. Riparian area 4. Grass land development	√	√	√	√	√
		Soil and Water Conservations Measures	√	√	√	√	√
		Control of Invasive and Alien Species	√	√	√	√	√
		Creations of Mounds/ Highlands	√	√	√	√	√
3	Wild Faunal Species Management	Conservative Breeding; Re-introduction of Species, etc.	√	√	√	√	√
4	Research and Development	Short Term Projects up to 1 year; Long Term Projects (5-Year)	√	√	√	√	√
		Essential Equipment and Field Infrastructure for facilitation of Research and Development and Monitoring					

Sr. No.	Components	Activities	Year				
5	Eco-development	Basic Infrastructure; Training to Tourist Guides of Peripheral Villages; Interpretation Centre for Nature Education	√	√	√	√	
6	Community Awareness and Participation	Creation of Self-help Groups (SHG), Provision of Revolving Fund for SHG; Alternate Income Generation Activities; Federation for Developing Entrepreneurship and Supply Management, etc.	√	√	√	√	√
7	Ecotourism	Provision of Essential Facilities; Regulation of Tourism Activities, etc.	√	√	√	√	

Table 2.37 - Cost Norms of Treatment Models for other Conservation Interventions in Jammu region (J&K) UT

Sr. No	Year	RV/JK/CI /06 Riverine and Riparian Management		RV/JK/CI /07 Wetland Management	
		Amount Rs/ha	Tentative Mandays	Amount Rs/ha	Tentative Mandays
	1st year	3,20,000	569	2,80,000	498
	2nd year	2,80,000	465	2,50,000	415
	3rd year	1,90,000	295	1,60,000	248
	4th year	1,20,000	174	1,20,000	174
	5th year	90,000	122	90,000	122

2.5.5 Supporting Activities

In addition to the above stated proposed forestry interventions in three types of landscapes (natural, agriculture, and urban) and three types of conservation interventions, execution of priority supporting activities is considered vital for the successful implementation of the present DPR and envisaged wide range of specific activities in the priority sites identified within the riverscape on the basis of geospatial analysis and inputs from the field. A list of supporting activities in given below (Table 2.38)

Table 2.38 - List of Supporting Activities

Sr. No.	Jammu and Kashmir UT
1.	RV/JK/SA/01- Policy Level Intervention
2.	RV/JK /SA/02- Strategic Adaptive Research and Development

3.	RV/JK /SA/03- Participatory Monitoring
4.	RV/JK/SA/04- Capacity Development
5.	RV/JK/SA/05- Awareness
6.	RV/JK/SA/06- Evaluation
7.	RV/JK/SA/07- Project Management

2.5.6 Project Budget

Implementation of Forestry Interventions in J&K UT accounts for Rs.95.74 Crores for all the components, Rs. 69.04 Crores for the three landscapes and SMC measures in establishment phase only and Rs. 84.04 Crores for Establishment and maintenance phase excluding establishment and maintence cost of supporting activities. Year-Wise Breakup of Extent and Cost Coverage of Proposed Forestry Interventions in Jammu and Kashmir are described in tables 2.40-2.58 and Division Wise modelwise/sitwise projected extent and cost tables of J&K UT are enclosed as Annexures 13 (a) to 18(b). The consent letters regarding availability of land in different landscapes in Jammu & Kashmir UT has been enclosed as Annexure 42 in Vol. II.

Table 2.39 - Physical and Financial Targets for in Jammu & Kashmir UT

Sr. No.	Component/ Activity	Amount (Rs. in Crore)
	Implementation of Forestry Interventions in Jammu Kashmir (A1+A2+C1+C3)	**84.04**
A.1	**Plantations and Treatment Models in Three Categories of Landscape**	**51.96**
A.1.1	Natural Landscapes	10.55
A.1.2	Eco Task Force	22.91
A.1.3	Agriculture Landscapes	0.94
A.1.4	Urban Landscapes	17.56
A.2	**Conservation Interventions**	**7.72**
A.2.1	Soil and Moisture Conservation	5.90
A.2.2	Riverine and Riparian Wildlife Management and	1.82
A.2.3	Wetland Management (Natural and Artificial)	-
A.3	**Supporting Activities**	**9.36**
A.3.1	Policy Level Interventions	0.06
A.3.2	Research Activities	0.84
A.3.3	Capacity Development	2.56
A.3.4	Awareness	2.21
A.3.5	Participatory Monitoring	0.31
A.3.6	Cost of PMUs of Two State Level Implementing Agencies	3.17

A.3.7	Evaluation	0.19
A.3.8	Contingency and Miscellaneous Activities	0.02
A.	**Implementation of Forestry Interventions in Jammu Kashmir (A1+A2+A3)**	**69.04**
B.	**Strengthening Knowledge Management and National Capacity for Forestry Interventions and Conservation of Riverscapes**	**0.00**
C.	**DPR – Phase II (Maintenance phase) Including Scaling Up and Replication of Successful Models of Forestry Interventions**	**26.70**
C.1	Maintenance Cost of A.1 and A.2 (Cost of Phase II)+ Establishment of Phase II ETF	21.42
C.2	Maintenance Cost of A.3	2.30
C.3	Scaling Up and Replication of Successful Models of Forestry Interventions (5% of A.1 & A.2)	2.98
D.	**National Coordination for Forestry Interventions and Riverscape Conservation**	**0.00**
Total Phase I (A+B+D)		**69.04**
Total Project Cost (Phase I+II) (A+B+C+D)		**95.74**

Table 2.40 - Year-Wise Breakup of Extent Coverage of Proposed Forestry Interventions in J&K UT

Year	Period	Plantation and Treatment Models				Conservation Intervention		
		Natural Landscape(ha) *	Eco Task Force (ha)	Agriculture Landscape (ha)	Urban Landscape (ha)	Soil and Moisture Conservation Measures (m^3)	Riverine and Riparian Wildlife Management (ha) **	Wetland Conservation (ha) **
B. Phase I (Implementation Phase)								
I	**Est.**	*460*	-	80	33	8730	-	-
II	**Est.**	*30*	200	77	47.19	6110	20	-
	Maint.	460	-	80	33	-	-	-
III	**Est.**	46	200	88	46.4	3210	-	-
	Maint.	490	200	157	80.19	-	20	-
IV	**Est.**	66	200	-	-	1260	-	-
	Maint.	536	400	245	126.59	-	20	-
V	**Est.**	128	200	-	-	280	-	-
	Maint.	602	600	165	93.59	-	20	-
Total Phase I	**Est.**	730	800	245	126.59	19590	20	-
	Maint.	602	600	245	126.59	-	20	-
B. Phase II (Maintenance Phase)								
VI	**Est.**	-	200	-	-	-	-	-
	Maint.	270	800	88	46.4	-	20	-
VII	**Est.**	-	-	-	-	-	-	-
	Maint.	240	600	-	-	-	-	-
VIII	**Est.**	-	-	-	-	-	-	-

Year	Period	Plantation and Treatment Models				Conservation Intervention		
		Natural Landscape(ha) *	Eco Task Force (ha)	Agriculture Landscape (ha)	Urban Landscape (ha)	Soil and Moisture Conservation Measures (m^3)	Riverine and Riparian Wildlife Management (ha) **	Wetland Conservation (ha) **
	Maint.	194	600	-	-	-	-	-
IX	Est.	-	-	-	-	-	-	-
	Maint.	128	400	-	-	-	-	-
X	Est.	-	-	-	-	-	-	-
	Maint.	-	200	-	-	-	-	-
Total Phase II	Est.	-	200	-	-	-	-	-
	Maint.	270	800	88	46.4	-	20	-
Grand Total Phase I and Phase II	Est.	730	1000	245	126.59	19590	20	-
	Maint.	730	1000	245	126.59	-	20	-

**Natural landscape includes area of fire protection and natural regeneration models of natural landscape; **Area is virtual, considered for calculation of budgetary provisions*

**Est.= Establishment; and maint.= Maintenance*

Table 2.41 - Year-Wise Breakup of Cost for Proposed Forestry Interventions in J&K UT

Year	Period	Plantation and Treatment Models				Conservation Intervention		
		Natural Landscape (Rs. in Lakhs)	Eco Task Force (Rs. In Lakhs)	Agriculture Landscape (Rs. in Lakhs)	Urban Landscape (Rs. in Lakhs)	Soil and Moisture Conservation Measures (Rs. in Lakhs)	Riverine and Riparian Wildlife Management (Rs. in Lakhs)	Wetland Conservation (Rs. in Lakhs)
C. Phase I (Implementation Phase)								
I	Est.	361.23	700.00	12.27	85.80	251.10	-	-
II	Est.	95.24	60.00	11.61	815.47	172.08	64.00	-
	Maint.	48.80	312.00	6.55	25.74	-	-	-
III	Est.	123.77	66.00	12.99	179.60	104.76	-	-
	Maint.	52.81	327.00	13.44	261.80	-	56.00	-
IV	Est.	189.57	72.00	-	-	56.70	-	-
	Maint.	62.27	332.00	21.57	229.84	-	38.00	-
V	Est.	43.83	80.00	-	-	5.04	-	-
	Maint.	77.03	342.00	15.07	158.24	-	24.00	-
Total PhaseI	Est.	813.64	978.00	36.87	1080.87	589.68	64.00	-
	Maint.	240.91	1313.00	56.63	675.62	-	118.00	-
VI	Est.	-	90.00	-	-	-	-	-
	Maint.	55.06	352.00	8.22	26.94	-	18.00	-

VII	**Est.**	-	-	-	-	-	-	-
	Maint.	43.60	386.00	-	-	-	-	-
VIII	**Est.**	-	-	-	-	-	-	-
	Maint.	30.25	380.00	-	-	-		-
IX	**Est.**	-	-	-	-	-	-	-
	Maint.	15.56	370.00	-	-	-	-	-
X	**Est.**	-	-	-	-	-	-	-
	Maint.	-	366.00	-	-	-	-	-
Total Phase II	**Est.**	-	90.00	-	-	-	-	-
	Maint.	144.47	1854.00	8.22	26.94	-	18.00	-
Grand Total Phase I and Phase II	**Est.**	813.64	1068.00	36.87	1080.87	589.68	64.00	-
	Maint.	385.38	3167.00	64.85	702.56	-	136.00	-

**Natural landscape also includes cost of fire protection and natural regeneration models*

**Est.= Establishment; and Maint.= Maintenance*

Table 2.42(a) – Division Wise Proposed Extent of Plantations in Natural Landscapes in Jammu Kashmir except for Protection of Forest Fire and Natural Regeneration in Jammu Kashmir UT

S. N	Division	Year									Year						Grand Total	
		Phase I							Phase I		Phase II							
		(Extent in ha)							Total (Extent in ha)		(Extent in ha)					Total (ha)	(Ha)	(Ha)
		I	II	III	IV		V				VI	VII	VIII	IX	X			
		Est.	Est.	Est.	Est.	Maint.	Est.	Maint.	Est.	Maint.	Maint.	Maint.	Maint.	Maint.	Maint.	Maint.	Est.	Maint.
1	Basohli	0	0	0	0	0	20	0	20	0	20	20	20	20	0	20	20	20
2	Billawar	0	21	0	21	0	68	21	89	21	89	89	89	68	0	89	89	89
3	Kathua	31	45	31	45	31	35	76	111	76	111	111	80	35	0	111	111	111
4	Samba	15	0	15	0	15	5	15	20	15	20	20	5	5	0	20	20	20
Total		**46**	**66**	**46**	**66**	**46**	**128**	**112**	**240**	**112**	**240**	**240**	**194**	**128**	**0**	**240**	**240**	**240**

***The area shown is virtually for calculation of Budget part. However actual creation of plantation work will start from 3rd year onwards.*

**Est.= Establishment; and Maint.= Maintenance*

Table 2.42 (a.1) – Division Wise Proposed Extent of Plantations in Natural Landscapes for Protection of Forest Fire and Natural Regeneration in Jammu Kashmir UT

Sr. No	Division	YEAR										
		Phase I (Extent of Area in ha)						Phase I		Phase II	Phase I &II	
		I	II		III	IV	V	Total		VI	Total Area ha	
		Est.	Est.	Maint.	Maint.	Maint.	Maint.	Est.	Maint.	Total Maint.	Estb.	Maint.
1	Basohli	110	0	110	110	110	110	110	110	0	110	110
2	Billawar	120	0	120	120	120	120	120	120	0	120	120
3	Kathua	130	0	130	130	130	130	130	130	0	130	130
4	Ramnagar	50	30	50	80	80	80	80	80	30	80	80
5	Samba	50	0	50	50	50	50	50	50	0	50	50
Total		**460**	**30**	**460**	**490**	**490**	**490**	**490**	**490**	**30**	**490**	**490**

Table 2.42 (b) – Division Wise Projected Cost of Plantations in Natural Landscapes except for Protection of Forest Fire and Natural Regeneration in Jammu Kashmir UT

Sr. No	Division	Year							Year					Grand Total		
		Phase I						Phase I	Phase II							
		(Rs.in Lakhs)						(Rs. in Lakhs)	(Rs. in Lakhs)							
		I	II	III	IV		V	Total	VI	VII	VIII	IX	Total	Rs. In lakhs		
		Est.*	Est.	Est.	Est.	Maint.	Est.	Maint.*	Est.	Maint.	Maint.	Maint.	Maint.	Maint.	Maint.	Est.	Maint.	Total Cost
1	**Basohli**	0	0	2.40	26.28	0	6.45	0	35.12	0	4.69	4.09	3.45	2.43	14.66	35.12	14.66	49.78
2	**Billawar**	0	3.27	36.55	98.46	0	23.27	5.68	161.54	5.68	21.17	18.19	14.54	8.27	62.17	161.54	67.85	229.38
3	**Kathua**	10.96	41.54	78.17	59.01	6.57	12.09	16.44	201.77	23.01	22.28	18.55	11.43	4.25	56.52	201.77	79.53	281.3
4	**Samba**	4.85	17.21	6.65	5.83	2.62	2.02	2.43	36.56	5.05	3.27	2.77	0.82	0.61	7.48	36.56	12.53	49.09
	Total	**15.81**	**62.02**	**123.77**	**189.57**	**9.19**	**43.83**	**24.55**	**434.99**	**33.74**	**51.41**	**43.6**	**30.25**	**15.56**	**140.82**	**434.99**	**174.56**	**609.55**

**Est.= Establishment; and Maint.= Maintenance*

Table 2.42 (b.1) – Division Wise Projected Cost of Plantations in Natural Landscapes for Protection of Forest Fire and Natural Regeneration in Jammu Kashmir UT

Sr. No	Division	YEAR											
		Phase I ((Rs.in Lakhs))						Phase I		Phase II	Phase I &II		
		I	II		III	IV	V	Total (Rs. in Lakhs)		VI	Total Cost (Rs. in Lakhs)		
		Est.*	Est.	Maint.*	Maint.	Maint.	Maint.	Est.	Maint.	Total Maint.	Est.	Maint.	Total
1	Basohli	78.66	0	11.63	11.76	11.73	11.52	78.66	46.64	0	78.66	46.64	125.3
2	Billawar	89.73	0	12.73	12.91	12.93	12.74	89.73	51.31	0	89.73	51.31	141.04
3	Kathua	100.81	0	13.82	14.07	14.12	13.95	100.81	55.96	0	100.81	55.96	156.77
4	Ramnagar	38.11	33.22	5.31	8.68	8.88	8.93	71.33	31.80	3.65	71.33	35.45	106.78
5	Samba	38.11	0	5.31	5.39	5.42	5.34	38.11	21.46	0	38.11	21.46	59.57
Total		**345.42**	**33.22**	**48.8**	**52.81**	**53.08**	**52.48**	**378.64**	**207.17**	**3.65**	**378.64**	**210.82**	**589.46**

**Est.= Establishment; and Maint.= Maintenance*

Table 2.43 – Division Wise Proposed Extent of Plantations in Agriculture Landscapes in Jammu Kashmir UT

Sr. No	Division	Phase I: Year Wise Area (ha)							Phase I Total Area (ha)		Phase II: Area (ha)	Total Area Phase II (ha)	Grand Total Area (ha)	
		I	II		III		IV	V			VI			
		Est.*	Estb.	Maint.*	Estb.	Maint.	Maint.	Maint.	Estb.	Maint.	Maint.	Maint.	Estb.	Maint.
1	Basohli	12	23	12.00	18	35	53	41	53	53	18	18	53	53
2	Billawar	18	12	18.00	18	30	48	30	48	48	18	18	48	48
3	Kathua	14	18	14.00	18	32	50	36	50	50	18	18	50	50
4	Ramnagar	23	12	23.00	17	35	52	29	52	52	17	17	52	52
5	Samba	13	12	13.00	17	25	42	29	42	42	17	17	42	42
Total		**80**	**77**	**80**	**88**	**157**	**245**	**165**	**245**	**245**	**88**	**88**	**245**	**245**

**Est.= Establishment; and Maint.= Maintenance*

Table 2.44 – Division Wise Projected Cost of Plantations in Agriculture Landscapes in Jammu Kashmir UT

Sr. No	Division	Phase I: Year Wise Cost (Rs in Lakhs)							Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
		I	II		III		IV	V			VI Year				
		Estb.*	Estb.	Maint.*	Estb.	Maint.	Maint.	Maint.	Estb.	Maint.	Maint.	Maint.	Estb.	Maint.	
1	Basohli	1.86	3.24	0.99	2.79	2.83	4.59	3.71	7.89	12.12	1.76	1.76	7.89	13.88	21.77
2	Billawar	2.79	1.86	1.49	2.79	2.64	4.35	2.83	7.44	11.31	1.76	1.76	7.44	13.07	20.51
3	Kathua	2.04	2.79	1.09	2.79	2.7	4.44	3.41	7.62	11.64	1.76	1.76	7.62	13.40	21.02
4	Ramnagar	3.24	1.86	1.73	2.31	2.91	4.39	2.56	7.41	11.59	1.47	1.47	7.41	13.06	20.47
5	Samba	2.34	1.86	1.25	2.31	2.36	3.8	2.56	6.51	9.97	1.47	1.47	6.51	11.44	17.95
Total		**12.27**	**11.61**	**6.55**	**12.99**	**13.44**	**21.57**	**15.07**	**36.87**	**56.63**	**8.22**	**8.22**	**36.87**	**64.85**	**101.72**

**Est.= Establishment; and Maint.= Maintenance*

Table 2.45 – Division Wise Proposed Extent of Plantations in Urban Landscapes in Jammu Kashmir UT

Sr. No	Division	YEAR											Grand Total Area (ha)	
		Phase I (Extent of Area in ha)							Phase I		Phase II			
		I	II		III		IV	V	Total		VI	Total		
		Estb*	Estb	Maint*	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Total	Estb.	Maint
1	Basohli	5	9.5	5	8	14.5	22.5	17.5	22.5	22.5	8	8	22.5	22.5
2	Billawar	6	8.79	6	8.4	14.79	23.19	17.19	23.19	23.19	8.4	8.4	23.19	23.19
3	Kathua	8	8	8	9	16	25	17	25	25	9	9	25	25
4	Ramnagar	6	9	6	10	15	25	19	25	25	10	10	25	25
5	Samba	8	11.9	8	11	19.9	30.9	22.9	30.9	30.9	11	11	30.9	30.9
Total		**33**	**47.19**	**33**	**46.4**	**80.19**	**126.59**	**93.59**	**126.59**	**126.59**	**46.4**	**46.4**	**126.59**	**126.59**

**Est.= Establishment; and Maint.= Maintenance*

Table 2.46 – Division Wise Projected Cost of Plantations in Urban Landscapes in Jammu Kashmir UT

Sr. No	Division	Phase I: Year Wise Cost (Rs in Lakhs)							Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
		I	II		III		IV	V			VI Year				
		Estb*	Estb	Maint*	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Basohli	13.00	245.80	3.90	20.80	76.34	57.35	41.03	279.60	178.62	3.12	3.12	279.6	181.74	461.34
2	Billawar	15.60	361.87	4.68	80.80	111.68	98.95	70.44	458.27	285.75	12.12	12.12	458.27	297.87	756.14
3	Kathua	20.80	20.80	6.24	23.40	10.40	14.30	7.80	65.00	38.74	3.51	3.51	65.00	42.25	107.25
4	Ramnagar	15.60	23.40	4.68	26.00	10.14	14.82	8.71	65.00	38.35	3.90	3.90	65.00	42.25	107.25
5	Samba	20.80	163.60	6.24	28.60	53.24	44.42	30.26	213.00	134.16	4.29	4.29	213.00	138.45	351.45
Total		**85.80**	**815.47**	**25.74**	**179.60**	**261.80**	**229.84**	**158.24**	**1080.87**	**675.62**	**26.94**	**26.94**	**1080.87**	**702.56**	**1783.43**

**Est.= Establishment; and Maint.= Maintenance*

Table 2.47 – Division Wise Proposed Extent for Soil and Moisture Conservation (Area in m^3) for Jammu Kashmir UT

Sr. No	Division	YEAR						Grand Total Area (ha)
		Phase I (Extent of Area in ha)					Phase I	
		I	II	III	IV	V	Total	
		Estb.	Estb.	Estb.	Estb.	Estb.	Estb.	Estb.
1	Basohli	200	250	0	0	0	450	450
2	Billawar	1380	700	450	450	0	2980	2980
3	Kathua	5550	4860	2760	810	280	14260	14260
4	Samba	1600	300	0	0	0	1900	1900
Total		**8730**	**6110**	**3210**	**1260**	**280**	**19590**	**19590**

**Est.= Establishment; and Maint.= Maintenance*

Table 2.48 – Division Wise Projected Cost for Soil and Moisture Conservation (Rs. in Lakhs) in Jammu Kashmir UT

Sr. No	Division	Phase I: Year Wise Cost (Rs in Lakhs)					Total Phase I (Rs.in Lakhs)	Grand Total (Rs.in Lakhs)
		I	II	III	IV	V		
		Estb	Estb	Estb	Estb	Estb	Estb	
1	Basohli	3.60	11.25	0	0	0	14.85	14.85
2	Billawar	56.70	12.60	16.20	20.25	0	105.75	105.75
3	Kathua	124.20	134.73	88.56	36.45	5.04	388.98	388.98
4	Samba	66.60	13.50	0	0	0	80.10	80.10
Total		**251.10**	**172.08**	**104.76**	**56.7**	**5.04**	**589.68**	**589.68**

**Est.= Establishment; and Maint.= Maintenance*

Table 2.49 – Division Wise Proposed Extent (in ha) for Riverine and Riparian Wetland Management and Wildlife Conservation in Jammu Kashmir UT

Sr. No	Division	Phase I: Year Wise Extent of Area (ha)*				Phase I Total		Phase II Year Wise Extent of Area (ha)*		Grand Total (ha)	
		II	III	IV	V			VI	Total		
		Estb*	Maint*	Maint	Maint	Estb	Maint	Maint	Total	Estb	Maint
1	Kathua WL	20	20	20	20	20	20	20	20	20	20
Total		**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**

Note: ***Area of Riverine & Riparian Wildlife Management and Wetland Management is virtual, considered for budgetary provisions*

**Est.= Establishment; and Maint.= Maintenance*

Table 2.50 – Division Wise Projected Cost (Rs. in Lakhs) for Riverine and Riparian Wetland Management and Wildlife Conservation in Jammu Kashmir UT

Sr. No	Division	Phase I: Year Wise Cost (Rs in Lakhs)				Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
		II	III	IV	V			VI Year				
		Estb*	Maint*	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Kathua WL	64	56	38	24	64	118	18	18	64	136	200
Total		**64**	**56**	**38**	**24**	**64**	**118**	**18**	**18**	**64**	**136**	**200**

**Est.= Establishment; and Maint.= Maintenance*

Table 2.51 – Year-Wise Projected Cost for Supporting Activities

Sr.No.	Activities	Year (Cost Rs. in lakh)											Total	Grand Total (Cost Rs. in lakh)
		Phase I					Total	Phase II					Phase II	Phase I+II
		I	II	III	IV	V	Phase I	VI	VII	VIII	IX	X		
1	Policy Level Interventions	1.52	1.12	1.17	1.23	1.29	6.33	0.40	0.00	0.00	0.00	0.00	0.40	**6.73**
2	Research	15.25	16.01	16.81	17.65	18.53	84.24	9.73	10.22	10.73	11.26	11.83	53.76	**138.00**
3	Capacity Development	50.00	52.50	60.13	57.88	35.90	256.41	0.00	0.00	0.00	0.00	0.00	0.00	**256.41**

4	Awareness	40.00	42.00	44.10	46.31	48.62	221.03	0.00	0.00	0.00	0.00	0.00	0.00	**221.03**
5	Participatory Monitoring	7.62	6.86	6.17	5.56	5.00	31.22	4.50	4.05	3.65	3.28	2.95	18.43	**49.65**
6	Project Management Unit	76.23	55.84	58.58	61.46	64.48	316.60	20.02	17.91	16.74	15.64	14.62	84.93	**401.53**
7	Evaluation	0.00	0.00	19.07	0.00	0.00	19.07	31.66	0.00	0.00	0.00	40.15	71.81	**90.88**
8	Contingency and Miscellaneous Expenses	0.38	0.28	0.29	0.31	0.32	1.58	0.10	0.09	0.08	0.08	0.07	0.42	**2.01**
Grand Total		**191.00**	**174.61**	**206.32**	**190.39**	**174.15**	**936.48**	**66.41**	**32.26**	**31.19**	**30.27**	**69.63**	**229.76**	**1166.24**

Table 2.52 – Year-Wise Projected Cost of UT Project Management Unit

Sr. No.	**Activities**	**Year**												**Grand Total**
		(Cost Rs. in lakh)												**(Cost Rs. in lakh) I+II**
		Phase I					**Total**	**Phase II**					**Total**	
		I	**II**	**III**	**IV**	**V**	**Phase I**	**VI**	**VII**	**VIII**	**IX**	**X**	**Phase II**	
1	Project Staff - Salary and Wages (PED/PEO/SPA+PA+OA+A1+DEO for each Division-5) and 50% staff in Phase II	46.2	48.51	50.94	53.48	56.16	**255.28**	17.69	16.72	15.80	14.93	14.11	**79.24**	**334.52**
2	Office Expenses (including executing Divisions)	4.62	0.49	0.51	0.53	0.56	**6.71**	0.18	0.17	0.16	0.15	0.14	**0.79**	**7.50**
3	POL (including executing Divisions)	4.62	0.49	0.51	0.53	0.56	**6.71**	0.18	0.15	0.11	0.07	0.04	**0.55**	**7.27**
4	Travel Expenses (including executing Divisions)	4.62	4.85	5.09	5.35	5.62	**25.53**	1.77	0.67	0.47	0.30	0.14	**3.35**	**28.88**

5	Equipment – Office and Field	2.31	0.02	0.02	0.02	0.02	**2.41**	0.02	0.02	0.02	0.02	0.02	**0.12**	**2.52**
6	Purchase of Equipment -Computer, RS and GIS and IT and maintenance	4.62	0.96	0.96	0.96	0.96	**8.44**	0.05	0.05	0.05	0.05	0.05	**0.24**	**8.68**
7	Furniture and Fixtures	4.62	0.05	0.05	0.05	0.05	**4.81**	0.05	0.05	0.05	0.05	0.05	**0.24**	**5.05**
8	Contingency and Miscellaneous	4.62	0.49	0.51	0.53	0.56	**6.71**	0.09	0.08	0.08	0.07	0.07	**0.40**	**7.11**
	Grand Total	**76.23**	**55.84**	**58.58**	**61.46**	**64.48**	**316.60**	**20.02**	**17.91**	**16.74**	**15.64**	**14.62**	**84.93**	**401.53**

Table 2.53 – Projected Cost of Awareness Programme

Sr.No.	**Activity**	**Phase I**					**Grand Total**
		Year					**(Cost Rs. in lakh)**
		(Cost Rs. in lakh)					
		I	**II**	**III**	**IV**	**V**	
1	Awareness Campaigns@1	5.00	5.25	5.51	5.79	6.08	**27.63**
2	Awareness Activities for General Public@2	10.00	10.50	11.03	11.58	12.16	**55.26**
3	Awareness Material – Pamphlets, Brochures, Booklets, Signages, Boards and Hoardings @2	10.00	10.50	11.03	11.58	12.16	**55.26**
4	Publicity Through Mass Media@3	15.00	15.75	16.54	17.36	18.23	**82.88**
Grand Total		**40.00**	**42.00**	**44.10**	**46.31**	**48.62**	**221.03**

Table 2.54 – Projected Cost of Capacity Development at UT and Division Level in J&K UT

Sr.No.	Activity	Norms Rs. in lakh	Phase I					Grand Total
			Year					(Cost Rs. in lakh)
			(Cost Rs. in lakh)					
			I	II	III	IV	V	
1	Local Level Training for Communities (Trainings; 2-3 days) 25	2.00	10.00	10.50	11.03	11.58	0.00	**43.10**
2	Division Level Trainings for SFD Personnel, Line Departments and Other Partner Agencies (1 Training/ Division/ 2-3 days) 25	2.00	10.00	10.50	11.03	11.58	0.00	**43.10**
3	UTLevel Inception Workshop (2-3 days) 1	5.00	5.00	5.25	5.51	5.79	0.00	**21.55**
4	UT Level Seminar – Mid Term (2-3 days) 1 and Final year (1)	5.00	0.00	0.00	5.00		5.51	**10.51**
5	Exposure Trip Within UT (30 participants; 2 per year)	5.00	10.00	10.50	11.03	11.58	12.16	**55.26**
6	Exposure Trip Outside UT (15 participants; 1 per year)	10.00	15.00	15.75	16.54	17.36	18.23	**82.88**
Grand Total			**50.00**	**52.50**	**60.13**	**57.88**	**35.90**	**256.41**

Table 2.55(a) - Division Wise Details of Area/Extent and Cost for Three Different Landscapes in Jammu Kashmir UT (Part-I)

Sr. No.	Division	Natural Landscape*				Agriculture Landscape				Urban Landscape			
		Total Area (ha)*	Cost (Rs. in Lakhs)		Total Cost (Rs. in Lakhs)	Total Area (ha)	Cost (Rs. in Lakhs)		Total Cost (Rs. in Lakhs)	Total Area (ha)	Cost (Rs. in Lakhs)		Total Cost (Rs. in Lakhs)
			Estb.	Maint.			Estb.	Maint.			Estb.	Maint.	
1	Basohli	**210**	113.78	46.64	160.42	53	7.89	13.88	21.77	22.5	279.6	181.74	461.34
2	Billawar	**299**	251.27	119.16	370.43	48	7.44	13.07	20.51	23.19	458.27	297.87	756.14
3	Kathua	**241**	302.58	135.49	438.07	50	7.62	13.40	21.02	25	65.00	42.25	107.25
4	Ramnagar	**80**	71.33	35.45	106.78	52	7.41	13.06	20.47	25	65.00	42.25	107.25
5	Samba	**70**	74.67	33.99	108.66	42	6.51	11.44	17.95	30.9	213.00	138.45	351.45
Total		**900**	**813.63**	**370.73**	**1184.36**	**245**	**36.87**	**64.85**	**101.72**	**126.59**	**1080.87**	**702.56**	**1783.43**

**In Natural Landscape, total area and total cost also include cost and area of fire protection and Natural Regeneration Models*

Table 2.55(b) - Division Wise Details of Area/Extent and Cost for Three Different Landscapes and SMC Activities in Jammu Kashmir UT (Part-II)

Sr. No.	Division	Grand Total Area of Three Landscapes (ha)	Total Cost of Three Landscapes (Rs. in Lakhs)	SMC Measures		Grand Total Cost of Three Landscapes and SMC (Rs. in Lakhs)
				Total Extent (m^3)	Total Cost (Rs. in Lakhs)	
1	**Basohli**	285.50	643.53	450	14.85	658.38
2	**Billawar**	370.19	1147.08	2980	105.75	1252.83

3	**Kathua**	316.00	566.34	14260	388.98	955.32
4	**Ramnagar**	157.00	234.50	-	-	234.50
5	**Samba**	142.90	478.06	1900	80.10	558.16
Total		**1271.59**	**3069.51**	**19590**	**589.68**	**3659.19**

Table 2.56 - Division Wise Details of Area and Cost for Riverine & Riparian Wildlife Management and Wetland Management in Jammu Kashmir UT

Sr. No.	Divisions	Total Area (ha)*	Cost (Rs. in Lakhs		Grand Total Cost (Rs. in Lakhs
			Estb.	Maint.	
1	**Kathua WL**	20	64	136	200
Total		**20**	**64**	**136**	**200**

Note: ***Area of Riverine & Riparian Wildlife Management and Wetland Management is virtual, considered for budgetary provisions*

Table 2.57 - Details of Area/Extent and Cost for Three Different Landscapes, SMC Activities and Riverine & Riparian Wildlife Management and Wetland Management in Jammu Kashmir UT

Sr. No.	Division	Grand Total Area of Three Landscapes (ha)	Total Cost of Three Landscapes (Rs. in Lakhs)	SMC Measures		Grand Total Cost of Three Landscapes and SMC (Rs. in Lakhs)	Riverine & Riparian Wildlife Management and Wetland Management		Grand Total Cost of Three Landscapes, SMC and Riverine and wetland Mgmt. (Rs. in Lakhs)
				Total Extent (m^3)	Total Cost (Rs. in Lakhs)		Total Extent	Total Cost (Rs. in Lakhs)	
1	**Basohli**	285.50	643.53	450	14.85	658.38	-	-	658.38

2	**Billawar**	370.19	1147.08	2980	105.75	1252.83	-	-	1252.83
3	**Kathua**	316.00	566.34	14260	388.98	955.32	-	-	955.32
4	**Ramnagar**	157.00	234.50	-	-	234.50	-	-	234.50
5	**Samba**	142.90	478.06	1900	80.10	558.16	-	-	558.16
Total		**1271.59**	**3069.51**	**19590**	**589.68**	**3659.19**			
6	**Kathua WL**	-	-	-	-	-	20.00	200.00	200.00
Total		**1271.59**	**3069.51**	**19590**	**589.68**	**3659.19**	20.00	200.00	**3859.19**

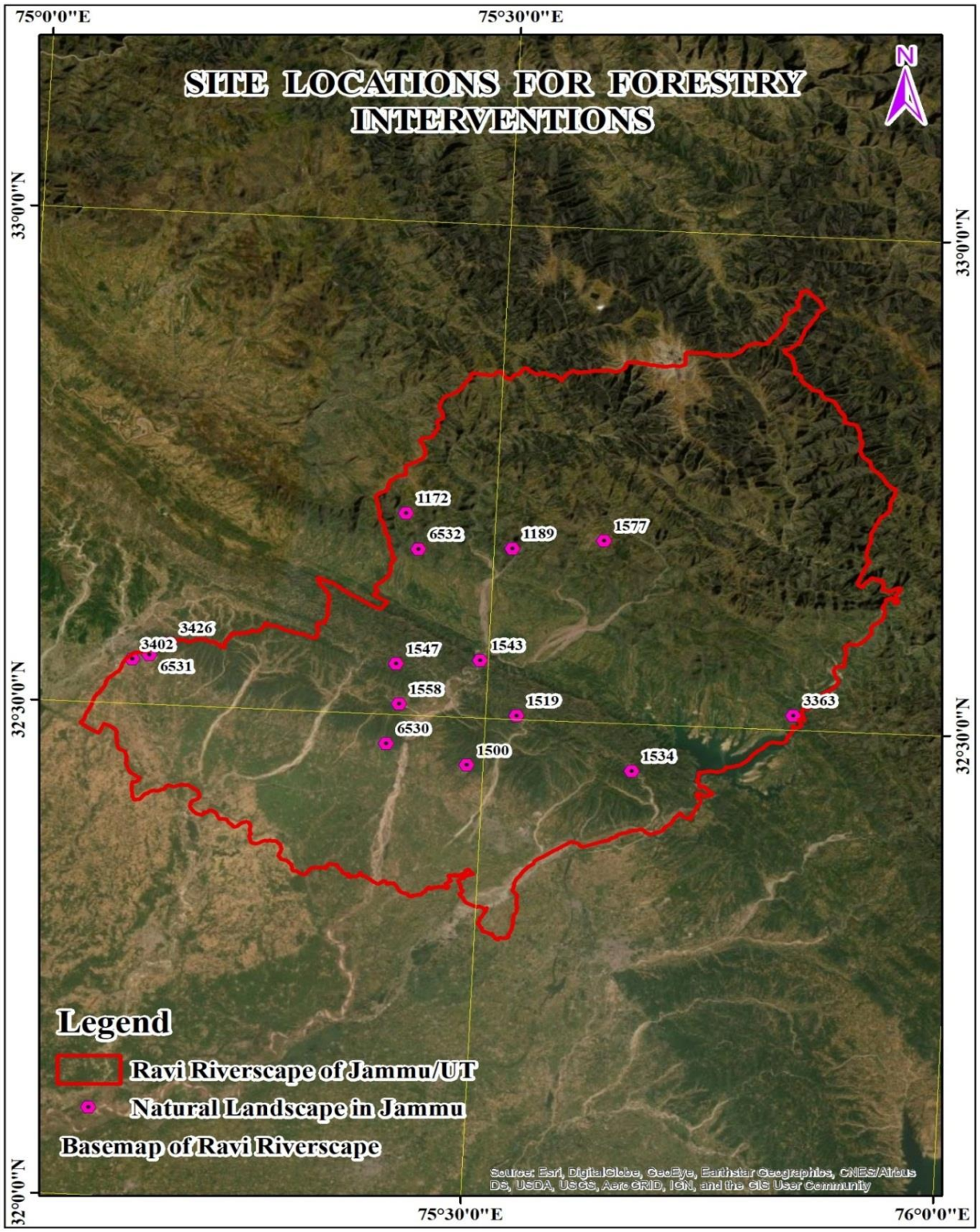
Table 2.58 - Details of Area/Extent and Cost for Three Different Landscapes, SMC Activities, Riverine, wetland and Eco Task Force in Jammu Kashmir UT

Sr No	Grand Total area of Three Landscapes (ha)	Grand Total cost of Three Landscapes (Rs. in Lakhs)	*SMC Measures		Riverine and Wetland Management		**ETF Measures		Grand Total Cost of Three Landscapes, SMC, Riverine and Wetland Management and ETF (Rs. in Lakhs)
			Total Extent (m^3)	Total Cost (Rs. in Lakhs)	Total Extent (ha)	Total Cost (Rs. in Lakhs)	Total Extent (ha)	Total Cost (Rs. in Lakhs)	
1.	1271.59	3069.51	19590.00	589.68	20.00	200.00	1000.00	4235.00	**8094.19**
Total	**1271.59**	**3069.51**	**19590.00**	**589.68**	**20.00**	**200.00**	**1000.00**	**4235.00**	**8094.19**

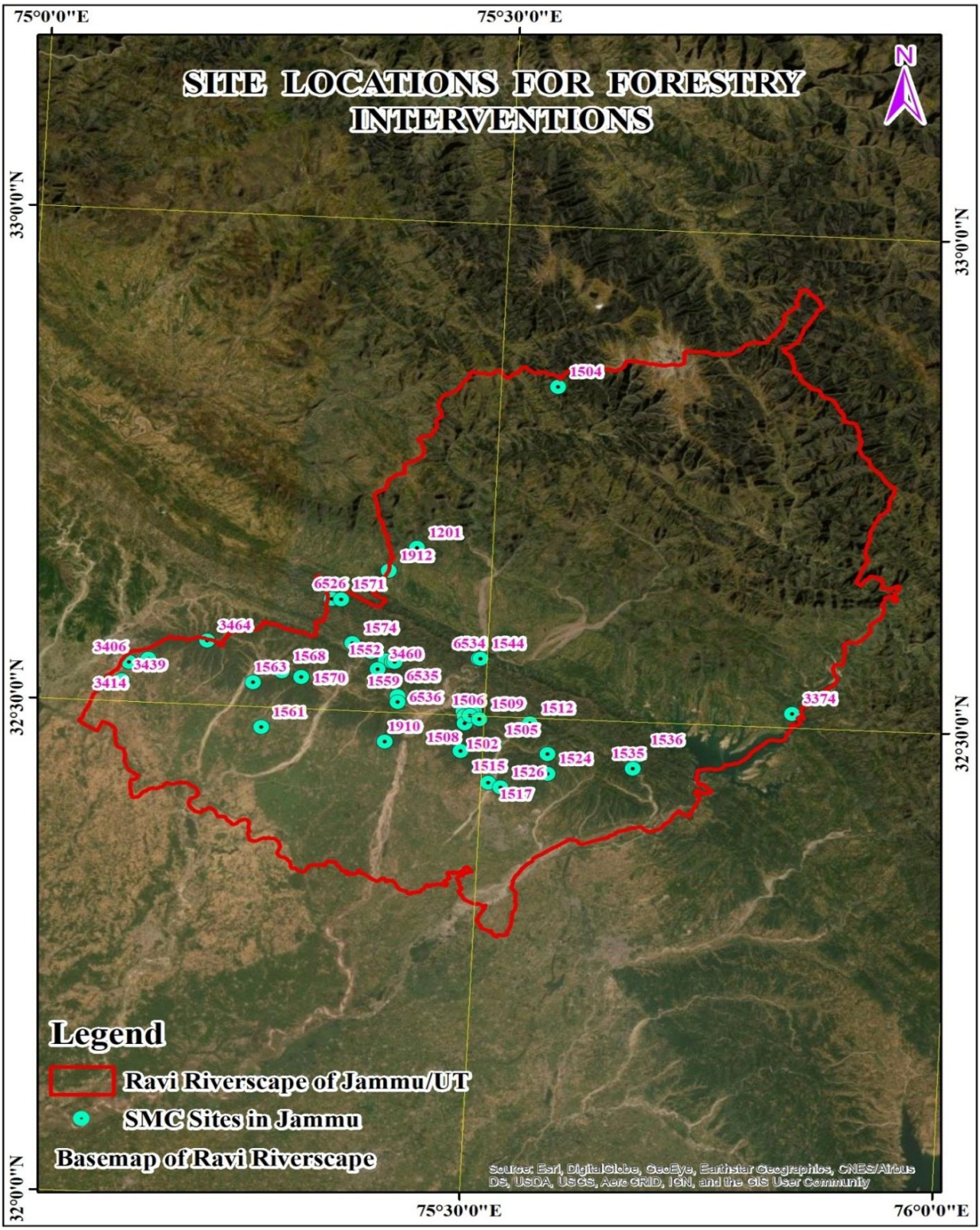
**SMC= Soil Moisture Conservation; and **ETF= Eco-Task Force*

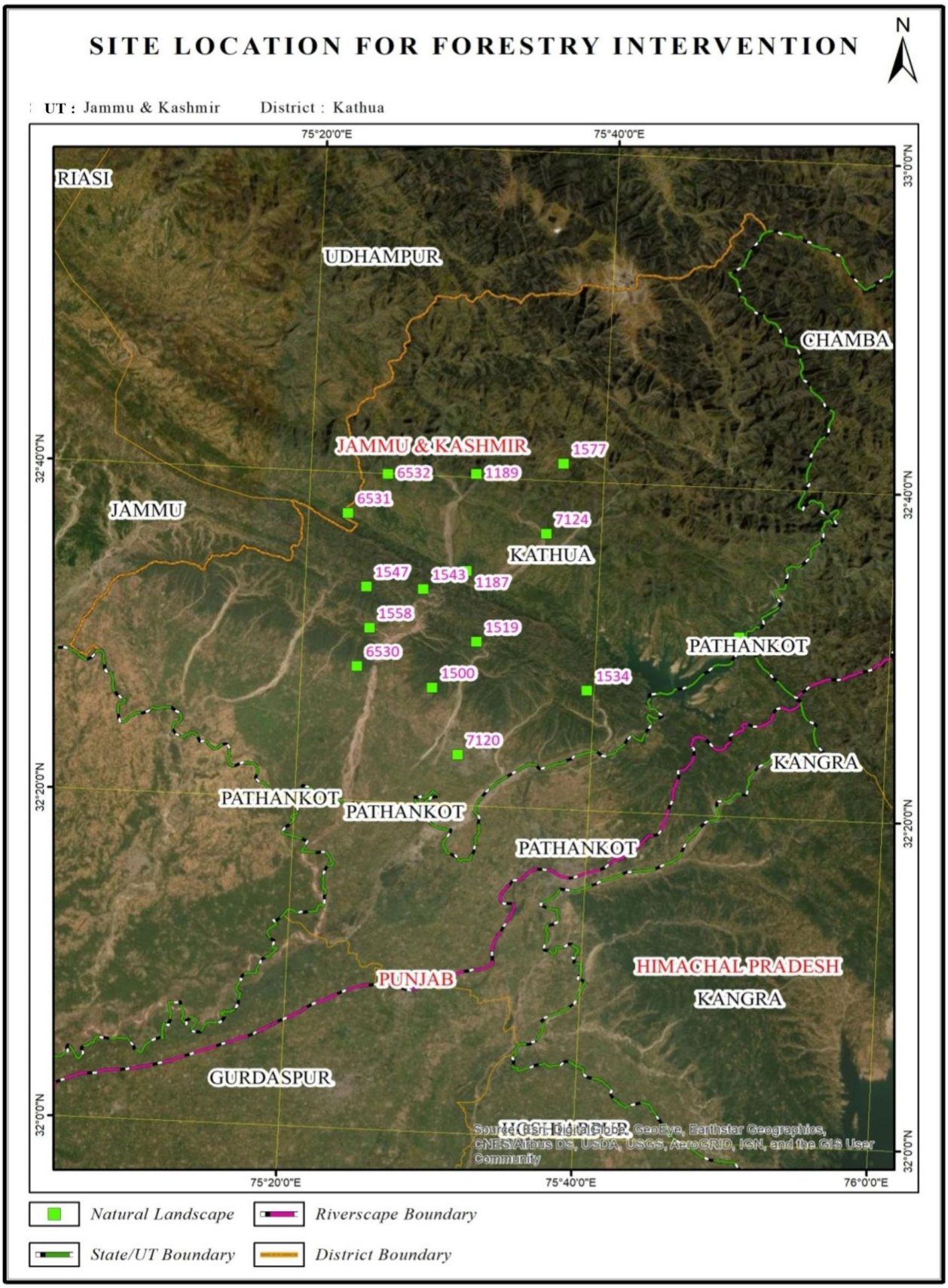
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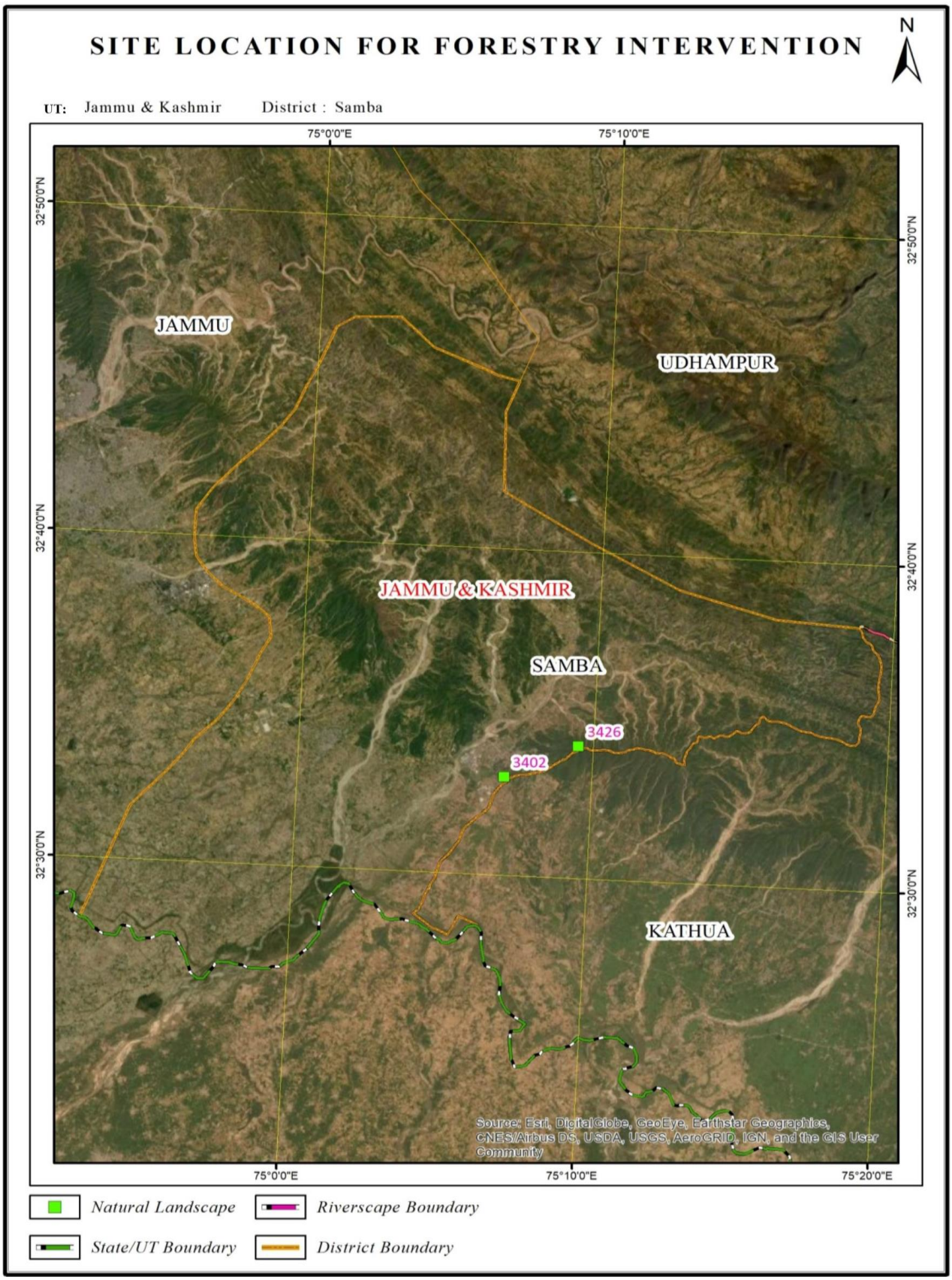
Site Locations For Natural Landscape Forestry Intervention in Jammu and Kasmir, UT for Ravi River

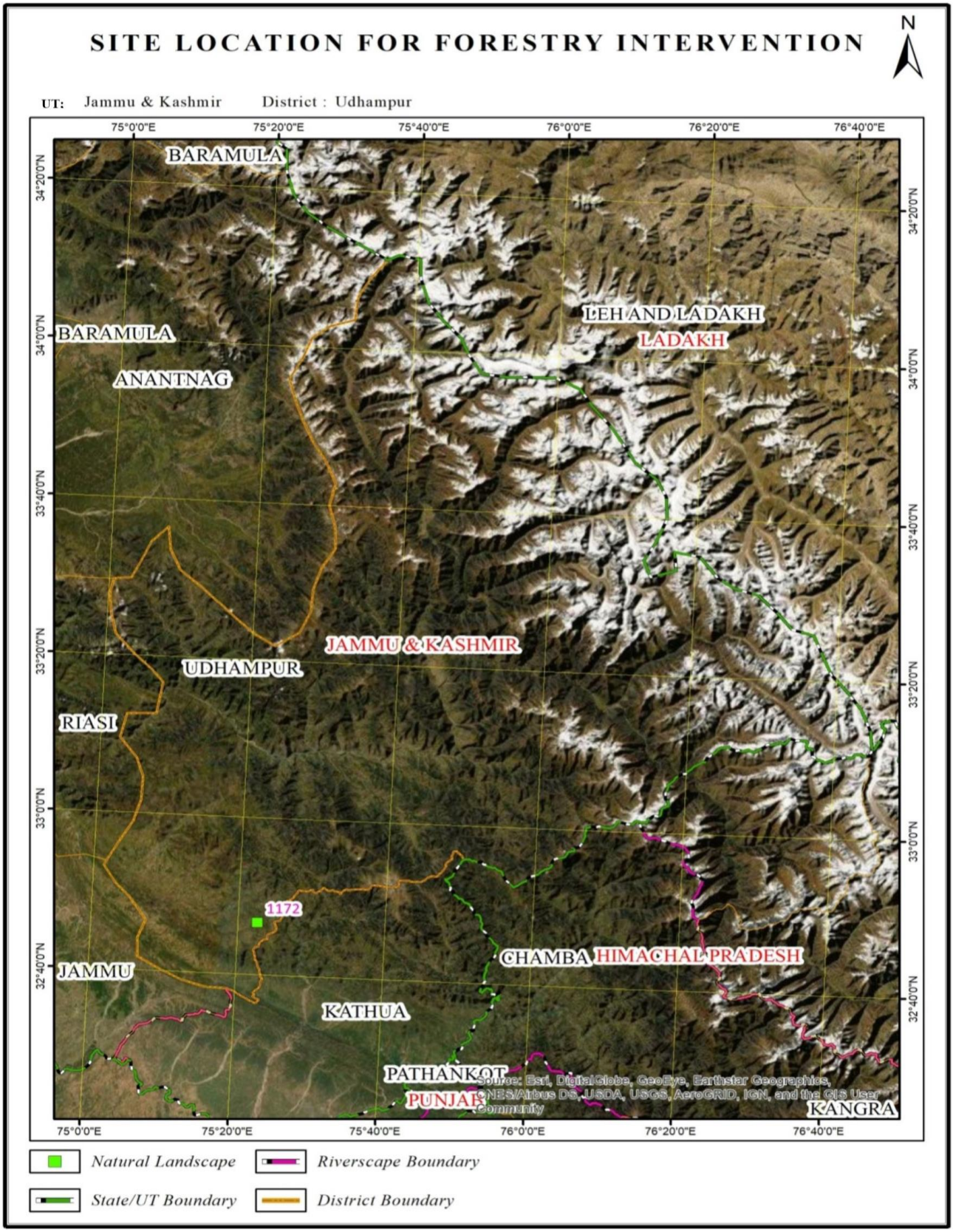


Site Locations For Soil and Moisture Conservation Measures Forestry Intervention in Jammu and Kashmir UT for Ravi River




SITE LOCATION FOR FORESTRY INTERVENTION
N
UT : Jammu & Kashmir
District : Kathua
75°20'0"E
75°40'0"E
76°0'0"E
33°0'0"N
32°40'0"N
32°20'0"N
32°0'0"N
RIASI
UDHAMPUR
CHAMBA
JAMMU & KASHMIR
1577
6532
1189
6531
JAMMU
7124
KATHUA
1547
1543
1187
1558
1519
6530
PATHANKOT
1500
1534
7120
KANGRA
PATHANKOT
PATHANKOT
PATHANKOT
HIMACHAL PRADESH
PUNJAB
KANGRA
GURDASPUR
Source: ESRI, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Natural Landscape
Riverscape Boundary
State/UT Boundary
District Boundary


SITE LOCATION FOR FORESTRY INTERVENTION
N
UT: Jammu & Kashmir
District : Samba
75°0'0"E
75°10'0"E
75°20'0"E
32°50'0"N
32°40'0"N
32°30'0"N
JAMMU
UDHAMPUR
JAMMU & KASHMIR
SAMBA
KATHUA
3426
3402
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Natural Landscape
Riverscape Boundary
State/UT Boundary
District Boundary


SITE LOCATION FOR FORESTRY INTERVENTION
N
UT: Jammu & Kashmir
District : Udhampur
75°0'0"E
75°20'0"E
75°40'0"E
76°0'0"E
76°20'0"E
76°40'0"E
34°20'0"N
34°0'0"N
33°40'0"N
33°20'0"N
33°0'0"N
32°40'0"N
BARAMULA
BARAMULA
ANANTNAG
LEH AND LADAKH
LADAKH
JAMMU & KASHMIR
UDHAMPUR
RIASI
1172
JAMMU
KATHUA
CHAMBA
HIMACHAL PRADESH
PATHANKOT
PUNJAB
KANGRA
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Natural Landscape
Riverscape Boundary
State/UT Boundary
District Boundary

PUNJAB

3.1 Introduction

The State, Punjab situated in the north-western part of India covers an area of 50,362 km^2 and represents 1.53% of the total geographical area of the country. It is bordered by the Indian States of Himachal Pradesh to the east, Haryana to the south and south east, Rajasthan to the southwest and Pakistan to the west (Fig. 3.1). In the north, Punjab is bounded by the Union Territory of Jammu and Kashmir. The term Punjab comprises of two words: '*Punj'* meaning five and '*ab*' meaning water, thus, the land of five rivers i.e., Sutlej, Beas, Ravi, Chenab and Jhelum, principal rivers of the Indus River System. After the partition of India in 1947, the larger unified province of Punjab during the British India was divided. The western portion of unified Punjab province went to Pakistan while the eastern part of Punjab became one of the States of the independent Indian Republic. In September, 1966, the Indian State of Punjab was reorganized carving out a new state of Haryana; territory was transferred to Himachal Pradesh, then a Union Territory; and the city of Chandigarh became a Union Territory to serve as the capital of both the residual Punjab and Haryana. Thus, the present Indian State of Punjab mainly comprises fertile alluvial plains while along the north eastern part of the State bordering Himachal Pradesh runs the belt of Outer Himalaya or low Shivalik hills. Now, only two major rivers i.e., Sutlej and Beas flow through the Punjab and one major river (Ravi) flows on its northern border. Roughly triangular in shape, the Punjab has a sensitive location and has great significance from the point of view of socio-economic development and defence (Gosal, 2004). The State is blessed with rich natural and cultural diversity.

3.2 State Profile

3.2.1 Geographical Extent

Punjab, among the smaller states of India, the land of five rivers an area of 50362 sq. km located between 29º30'- 32º32'N latitudes and 73º54' - 76º50'E longitudes. Physiographically, it is situated in the north western part of India sharing a 300 km long international border with Pakistan in the west. In spite of many upheavals, the state has achieved tremendous success in the economic and food front. It enjoys the distinction of being the food bowl of the country and has the country's highest per capita income.



Fig. 3.1 - Punjab State

(Source: Aggarwal and Garg, 2015)

Punjab is predominantly an agrarian state and more than 60 % of the population lives in the rural areas. The state is sub-divided into three parts, Malwa, Majha and the Doaba. Malwa region constitutes majority of the region in the state and comprises of cities like Ludhiana, Patiala, Bhatinda and Mohali, whereas Majha embrace modern districts of Amritsar, Gurdaspur and Tarn Taran. Doaba region is considered among the most fertile regions of the world. About, 84 % area is under intensive cultivation, with a cropping intensity of 184 %. The state has 22 districts, 81 tehsils, 168 statutory towns and 69 census towns and about 12858 villages, with the area being generally plain (180-320 m amsl) except for the Sub-Himalayan Shivalik foothills in the North Eastern Border (300 - 800 m amsl).

3.2.2 Geology, Topography and Soil

(A) Geology

In Punjab, land is used for agriculture all year round, but today many industries like thermal power plants, fertilizer factories, chemical factories, and cement factories are well established here. The soil in the plains is mainly alluvial and suitable for cultivation. However, the monotony of its well mended fields is broken in patches by water courses,

wetlands and sand dunes besides an elongated green, undulating elevated stretch of the Shivalik hills towards the north. The alluvium thickness steadily decreases southwards where the basement depth is shallow. This heterogeneous alluvium ranges in age from the upper pliestocene to the present, and is generally classified into older and newer alluvium and consists of clay, gravel, sand, silty sands and clays with varying proportions of *Kankar*. In the western and south-western parts, this alluvium is occupied by windblown, fine grained, buff coloured sand in the form of dunes. The area is also in close vicinity to the trans-Aravali Vindhyan Basin. The highest part of the Aravali-Delhi ridge which is at about 400 m depth passes through Sirsa-Mansa and Faridkot regions. The basement rocks go down rapidly from Tusam to Bathinda, while east of Sirsa, rocks of Malani suite, granites and rhyolites and Delhi quartzite are encountered below the quaternary sediments. At Zira, near Ferozpur, granites rocks are met at a depth of 700 m below the Shivalik sediments. The maximum depth to basement in Punjab plains is between 4-5 km and depth increases to some extent under the Shivalik ranges.

(B) Topography

Punjab is an extensive alluvial plain gently sloping from about 350 m amsl in the northeast and the north to about 180 m. in the southwest and it lies between the Yamuna River on the east and the Indus River on the west, and fringed by a dissected foot-hill zone and the Shivalik foothills in the northeast and the north. The south-western fringe of the region is undulating and desertic, but has gradually been becoming level with the extension of cultivation and irrigation. The region is a great mass of alluvium brought down by the Indus and the five rivers, uniting in the southwest at Panjnad. In between the Sutlej and the Yamuna Rivers in the east, the Ghaggar River and its tributaries contributed to the same process of alluviation in what is now called the Malwa Tract. With about 90 per cent of the total area as plain, the rivers has low lying flood plains and the monotonously flat upland plains between them, the region is an extensive level tract of land.

In general, Punjab is a predominantly flat and featureless land form; however, it presents a varied relief when viewed from micro-regional levels. The entire landscape of Punjab can be segregated into the following landform types described below (Gosal, 2004).

1. Shivalik Hills

The State is bordered by the Shivalik hills on its northwest, north and northeast along the foot of the Himalaya. They are fairly wide in the north-west and the north, and are only a narrow zone in the northeast. The Shivaliks are formed of Mio-Pleistocene sands, conglomerates and gravels. The hills generally range between 300 - 1000 m amsl and provide a sharp contrast to the predominantly level topography in much of the region. They are quite denuded and dissected by discontinuous series of longitudinal valleys (duns) and generally covered with only bush and stunted vegetation.

2. Dissected Foot-Hill Zone

Around 10-15 km wide stretches a narrow dissected undulating zone with seasonal streams, locally called *Chos* along the foot of the Shivaliks. These *Chos* are closely spaced, and do not run for long distances, but cause large scale soil and gully erosion. This tract of the Shivalik foothill zone is locally called the *Kandi* Tract.

3. Upland Plains

All these upland plains are made of old alluvium originally deposited by the major rivers descending from the Himalaya. From the Sutlej River to the Indus River the Punjab plain gradually slopes westward forming the interfluvial tracts formed as a result of the westward shift of the rivers courses. The plains in general look featureless and flat, slope from the northeast to the southwest. In the Malwa Tract, there is a discontinuous chain of sand dunes south of the Sutlej flood plain formed as a result of the shifting of the rivers course to the west, leaving mounds of sand in its earlier course. The Western Malwa Tract, which was strewn with sand-dunes in early 1950s, has now been levelled and brought under cultivation with the help of canal and tubewell irrigation, now looks like any other well developed plain area. The southern parts of West Punjab have relatively different surface conditions due to much drier climate than their counterparts on the East side.

4. Flood Plains

The flood plains along the rivers are linear tracts having a width not more than 10 - 15 Km. The flood plains are formed of new alluvium deposited by the rivers during the rainy season annually These plains earlier wastelands, but now practically all are under extensive cultivation. They have been shifting their courses in varying degrees to the west, therefore the western banks are relatively steep leaving little scope for their development. On the other hand the flood plains on the eastern side of the rivers are relatively extensive and wide.

Sutlej River floodplains begin from the point the river enters the plain near Ropar and extends up to Fazilka town in Ferozepur district. It is much wider in the south of the river than to its north due to westward shift of its course. A section of the flood plain lies between the Sutlej and Budha *Nallah*, the old course of the Sutlej River. The presence of the remnants of oxbow lakes between the old course and the present one provide demonstrative evidence of the shift of the river's course to the west. An extensive flood plain tract is formed near Harike Patan where the Sutlej River is joined by the Beas River. The floodplain of the upper Ravi River lies between the river and the Sakki-Kiran stream which is thought to have been the old course of the river. The floodplain is 10 - 15 Km wide, but in Gurdaspur region, it is only 3 - 4 Km. The flood plain of the lower Ravi River is wider, widening with the western shift of the river in the past.

Table 3.1 - Summary of the Rivers of Punjab

Name	Length	Place of origin	Terminates in
Sutlej	1500	Rakshastal Lake in Tibet	Chenab River
Beas	470	Beas kund in Himalaya, HP	Sutlej River at Harike in Tarn Taran district
Ravi	720	Kangra district of HP	Chenab River

(C) Soil

The soils of Punjab have been classified to cover the broad categorisation of the State into the following major types.

(i)Flood plain/Bet Soils: Flood Plain or Bet Soils are Khadar soils of the periodically flooded or old flood plain areas of various rivers, Streams or *Chos* of the state. These type of soils are found in the form of elongated belts on the both side of the river channel such as those of Sutlej, Ravi, Beas and Ghagghar River.

(ii) Sandy Soils: These are arid soils of south-western and south central Punjab covering the districts of Bathinda, Mansa, southern parts of Firozepur and Mukatsar districts, larger parts of Sangrur, some patches of Ludhiana district and south-central parts of Patiala district.

(iii) Loamy Soils: It is the most important, fertile and productive soil group of the state, found predominantly in the Nawa Shehar District, larger parts of Nakoder tehsil of Jalandhar district, Phagwara and central parts of Kapurthala district.

(iv) Desert Soils: These types of soils are formed under arid and hot climate with thin cover or bush vegetation, it covers more than 11 % of the total area of the state. These soils belong to the aridic zone spreading over south -western parts of the state in Abohar tehsil and some area of Firozpur district, Mukatsar district, large parts of Bathinda and Mansa districts, and some patches in Sangrur and Ludhiana district.

(v) Kandi Soils: These soils have a sandy, sandy loam, silt loam and clay-silt to gravelly texture. They are found in the areas of Pathankot, larger parts of Hoshiarpur, Nawashehar and Ropar districts.

(vi) Sierozems: Sierozems are grey soils of semi-arid parts of Punjab with an average annual rainfall of 50-70 cm and air temperature ranging between 24° C - 25° C. These soils are found in eastern half of the Malwa plains in Ludhiana districts, northern and central parts of Sangrur district, Fatehgarh Sahib, Rajpura and Patiala districts, western parts of

Patiala district and some areas of Faridkot districts.They have grass and deciduous vegetation and cover nearly 25 % area of the state.

(vii) Grey-Brown Podzolic and Forest Soils: These soils have developed under shrub and deciduous forests, steep slopes and rugged topography, much water erosion and less hot temperature conditions. These are stony, gravelly and sandy soils, reddish brown to olive brown in colour and occur in some blocks of Gurdaspur districts and Shivalik hill zone of Hoshiarpur, Nawashehar and Ropar districts.

(viii) Sodic and Saline Soils: Due to climate and topography, anthropogenic activities and mismanagement, soils suffer from various kinds and degree of degradation, particularly salinity and sodicity. The pH values are generally 7.3 to 8.5 and the soil is neutral in reaction. Sodic soils have a higher percentage of sodium (>15 %) salt and high pH value of 8.5 above and strong alkaline reaction (ENVIS, 2015).

3.2.3 Climate

Punjab is characterized by a continental, semiarid to sub-humid climate in conformity with its inland position, and tropical and sub-tropical location. It is also bounded by western Himalaya in the north and the 'Thar' Desert in the south and south-west which mainly determine its climatic conditions. It receives south-easterly current of the summer monsoons coming over the Bay of Bengal. The climate of Punjab is greatly influenced by these factors. Its climatic rhythm, as of other parts of India, is defined by the change of seasons. The contrast between summer and winter is well marked, and these two primary seasons are associated with two main crop seasons of Kharif (Autumn) and Rabi (Spring), respectively. The summers are extremely hot and winters slightly cool. The mean monthly maximum temperature (June) is as high as 42°C while the mean monthly minimum temperature (January) is as low as 4.7°C. The mean annual rainfall is 705 mm, which varies from 1200 mm at Pathankot to less than 300 mm at Abohar, representing the wettest and driest stations, respectively. Thus, the climate of the state can be considered as predominantly semi-arid to monsoon types. The mean annual rainfall of the State varies from less than 300 mm to about 1400 mm per annum. According to the Thornthwaite (1948) classification system, the state of Punjab can be divided in to six climate zones (Sehgal 1970).

i. Arid and Hot zone
ii. Semi-arid (dry) and Hot zone
iii. Semi-arid (dry) and Less-hot zone
iv. Semi-arid (semi-dry) and Less-hot zone
v. Semi-arid (Sub-moist)and Less-hot zone
vi. Sub- humid (dry)and Less-hot zone

3.2.4 River system and Hydrology

River System

The land of five rivers, Punjab is drained by five perennial rivers, numerous seasonal streams like the Ghaggar and hundreds of gullies. The discharge of these perennial rivers is subject to wide fluctuations ranging from a flush during the monsoons to a low current during late winters. The perennial rivers are not dependent on monsoon rainfall alone for their water supply, but also get supply from the melting of the Himalayan glaciers (Gosal, 2004).

Ravi River

Ravi River comes out from the Himalayan ranges of Chamba district of Himachal Pradesh. Flowing in north-westerly direction from its source, it drains the area between the Pir-Panjal and the DhaulaDhar Ranges. After passing through Chamba district it enters the Punjab plains near Madhopur. It joins the Chenab River a little above Rangpur in West Punjab after flowing for a distance of about 725 km from its source. Its total catchment area is 14,442 km^2 of which only about 6000 km^2 lies in India. To the west of the Ravi River, there is Degh Stream which runs parallel to it for about 240 kms before joining it. The place where Ravi River joins the combined Jhelum-Chenab course is known as Trimab (three rivers).

Throughout its course in East Punjab, the river flows in a comparatively narrow valley. The fluctuations in its discharge are significantly less than those of the Beas River. However, in its course in western Punjab, several changes and shifts are thought to have taken place in the past.

Other important drainages

Ghaggar

In addition to its rivers there is another historically important stream, the Ghaggar also called Sarasvati, which has been closely linked with the physiographic and cultural evolution of the part of the Punjab plains. Ghaggar takes its origin from the lower Himalaya in Sirmur districts and is an inland and largely a seasonal stream. After a short journey, it enters the plains near Mubarakpur and traverses through the eastern part of Patiala district, the southern section of Sangrur district, and the lower tip of Mansa district. It finally leaves Punjab and moves into Rajasthan to lose itself in the sands near Hanumangarh.

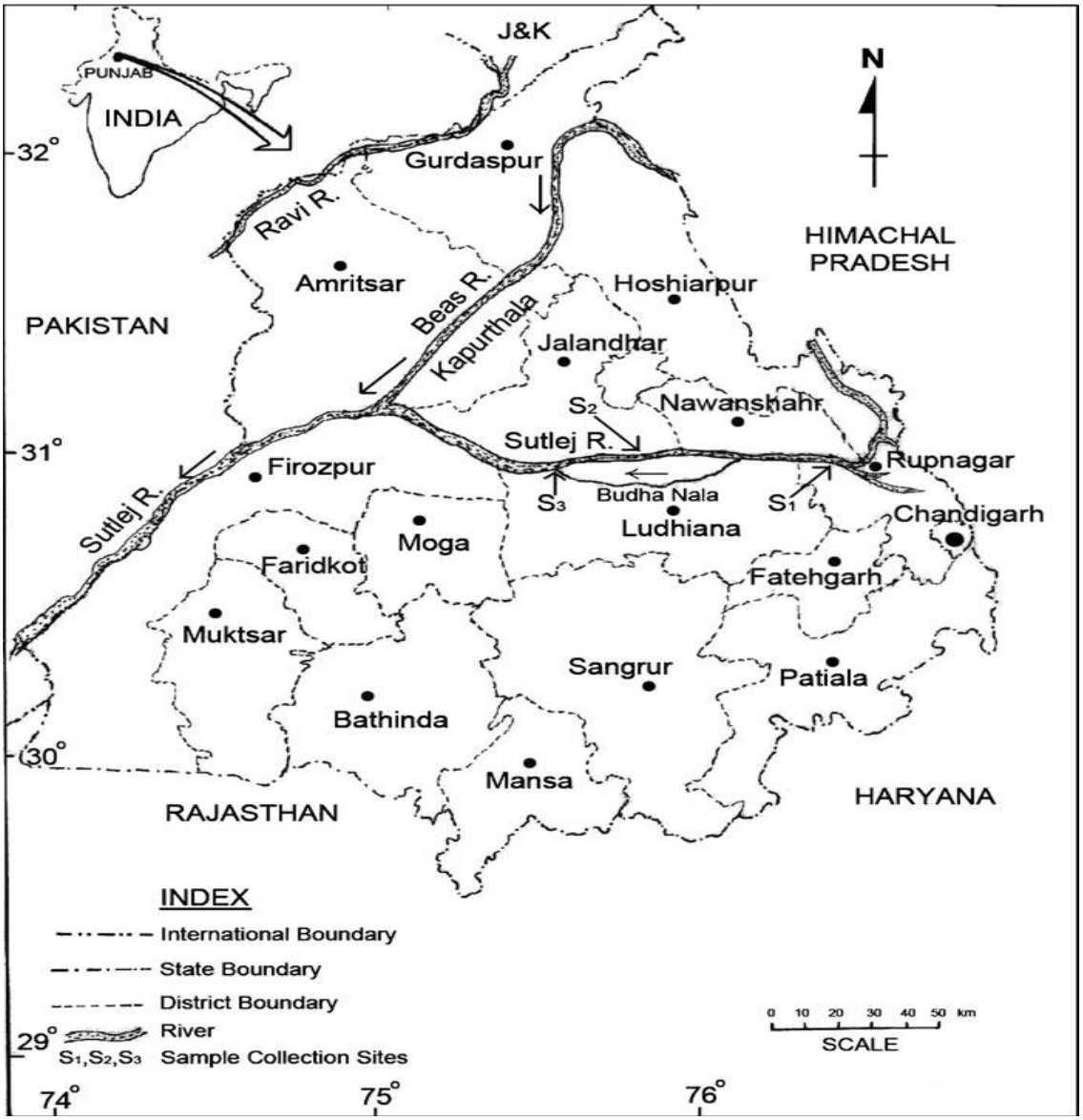


Fig. 3.2 - River System of Punjab
(Source: Jindal & Sharma, 2011)

Buddha *Nallah*

A seasonal stream which runs through the Malva region of Punjab and after passing through the highly populated district of Ludhiana, it drains into the Sutlej River.

Seasonal Streams (*chos*)

In addition to the main drainage described above, scores of seasonal streams, present another notable feature of the Punjab drainage system. These seasonal streams infest the area immediately south of the Shivalik hills. Most of them start from the southern slopes of these hills, dissect their way through the foothill zone for 10-20 Km and soon exhaust themselves dry, or fall in some nearby river or in one of its tributaries.

Hydrology

Perennial Rivers, Sutlej, Beas, Ravi and ephemeral Ghaggar River drain the state of Punjab. It is predominantly an Agriculture state with a vast network of canal system for irrigation. Its surface water resources are being fully utilized, and to meet the growing demand of water for irrigation and other diverse purposes, the ground water is being exploited extensively. It is facing the problem of 'Falling ground water level' in about 80 % of the State. The annual normal rainfall is around 550 mm in the plains and 890 mm in the sub-mountainous regions near lower Shivaliks in the East. Rain is primarily provided by the South-West monsoon during the months of June-September.

3.2.5 Water Resources Issues

A severe water crisis has been faced by Punjab due to lesser annual rainfall than normal (700 mm) since 1998. Further, Punjab is not getting adequate amount of river water due to political reasons like Indus Water Treaty, damming and diversion of river water, water conflict with Haryana, Rajasthan, and Central Government. However, the irrigation water demand (4.45 m ham) is significantly more than total irrigation water availability (3.04 m ham). Hence, in most parts of the state, groundwater is being overexploited for irrigation and apart from this water scarcity; water quality is also being deteriorated and is not suitable for drinking. Basic groundwater parameters such as electrical conductivity (EC), chloride (Cl^-), salinity, and nitrate (NO_3^-) have surpassed the maximum permissible limit in most parts of this state. Even toxic heavy metals i.e., Uranium, Selenium, Arsenic, Lead and pesticides have also been reported in groundwater samples of several regions of the state. The health of the villagers been affected by the intake of this contaminated water, especially in the Malwa region. Government is taking several initiatives regarding this issue and passed the Punjab Preservation of Sub-Soil Water Act (2009). Government is also providing subsidy to individual farmer to lay down underground pipeline, drip and sprinklers systems for irrigation. In addition to this, government is promoting and appreciating preventive measures like watershed management and rainwater harvesting.

3.2.6 Forests and Vegetation

Punjab Forests and Wildlife Preservation Department is making efforts to increase the forest cover in accordance with the National policy, 1980. Simultaneously, measures are being taken to protect and conserve the existing tree species and fauna to arrest and reverse ecological degradation. The current forest cover of the State is 1,837 km^2, which is 3.65 % of the state's geographical area. Plains of Punjab do not have any thick forest; the only available patches are of grass, small bush and shrubs.

Based on Champion and Seth1968 classification of forest types the state has seven types of forests which have been briefly described below.

- **Northern dry mixed deciduous forests:** Here, the vegetation is xerophytic in nature and there is a preponderance of species like *Senegalia catechu, Acacia leucocephala, A. nilotica, Anogeissus latifolia, Buchanania lanzan*, etc.
- **Dry deciduous scrubs:** Mostly found in the Kandi tract, consisting of *Nyctanthus arbortristis, Carissa opaca, Grewia tenax,* etc. Plantations of economically important species like *Senegalia catechu* and *Eulaliopsis binata* have also been undertaken in these areas.
- **Khair-Sissoo:** These forests are found scattered in nature along the streams. These are mostly man-made forests as a result of plantings in the foothills along *choe*s (streams) and *Mand* areas with Khair, Sissoo and Eucalyptus hybrids. Groves of mango are found in these forests.
- **Butea forests and saline/alkaline scrub savannah:** This forest has been converted into plantations of commercial species like *Eucalyptus* spp., *Dalbergia sisso, Senegalia catechu, Morus alba,* etc. Small patches of natural vegetation survive in village wastelands in the plains.
- **Dry bamboo brakes:** These are formed in certain parts of Hoshiarpur and Roopnagar districts bordering HP and also Gurdaspur. The forests of Karanpur and Bindraban in Dasuya Forest division are mainly bamboo areas where *Dendrocalamus strictus* occurs gregariously. The other associates are *Lannea coromandelica, Diospyros montana, Butea monosperma, Holoptelea integrifolia* and *Cassia fistula*.
- **Shivalik Chir pine forests:** *Pinus roxburghii* (Chirpine) found in elevations above 850 m amsl in parts of Bari Khad, Dehrian, Chattarpur, Dhar, Dunera and Nurpur Bedi forests. Associated species are *Terminalia alata, Terminalia bellerica, Terminalia chebula, Anogeissus latifolia, Phyllanthus emblica, Cassia fistula,* etc.

(A) Forest Cover and Change

The term 'Recorded Forest Area (RFA)' refers to all the geographic areas recorded as 'Forests' in the government records. RFAs largely consist of Reserved Forests (RFs), Protected Forests (PFs), and Un-demarcated Forests (UDFs) or Unclassified Forests constituted as per the provisions of the Indian Forest Act, 1927. The situation of forests in terms of RFA in the alluvial plains of Punjab was dismaying in proportion to its larger size (Fig. 3.3). This agriculture dominated State just contributed a small proportion i.e., 6.12% of RFA of the geographical area of the State while the State represented a minuscule RFA i.e., 0.40% of the overall extent of the country (Table 3.2).

Table 3.2 - Recorded Forest Areas (RFAs) in Punjab

Sr. No.	Geographical Area of the State km^2	Reserved Forest km^2	Protected Forest km^2	Unclassed Forest km^2	Forest Recorded Area km^2	Representation of RFA of the States' Geographical Area (%)	% of India's Forest Area (%)
1	50,362	44	1,137	1,903	3,084	6.12	0.40

(Source: FSI, 2019)

The term 'Forest Cover' refers to all land more than 1 ha in area with a tree canopy more than 10% irrespective of land use, ownership and legal status. The close scrutiny of information on forest cover provided by FSI (2019) revealed that out of the total estimated forest cover of 1,837 km^2 in the State, a small area (8 km^2) was under the category of Very Dense Forests (VDF) Forest i.e., lands with tree canopy density of >70% while as much as much 1,023 km^2 area of forests was under the category of the Open Forests (OF) i.e., lands with tree canopy density of 10% to <40%. The Moderately Dense Forests (MDFs) with >40% and <70% canopy density covered 806 km^2 of total forest cover of the State (Fig.3.4). A meager extent of just 8 km^2 of VDFs in Punjab justify improvement of forests by way of protection, massive plantation and interventions like assisted natural regeneration and gap planting (Table 3.3).

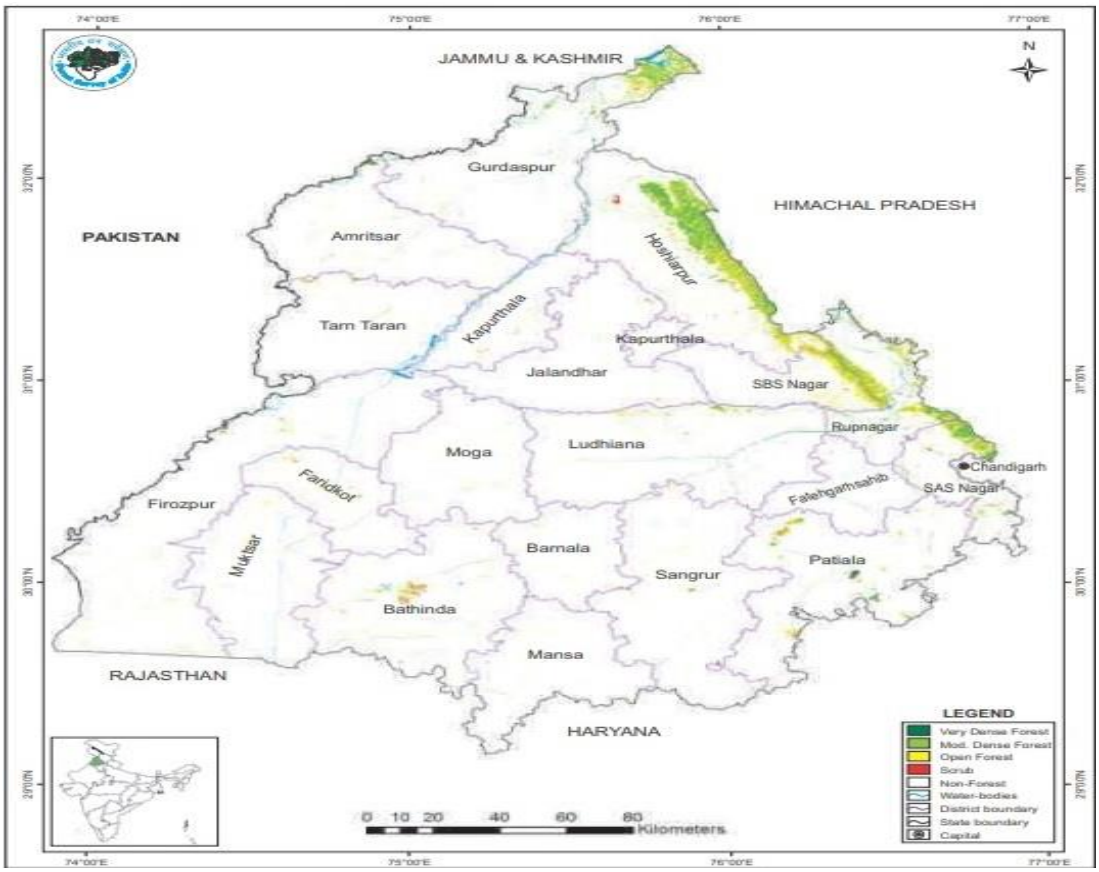


Fig. 3.3 - Forest Cover in Punjab
(Source: FSI, 2019)

Table 3.3 - Forest Cover in Punjab

Sr. No.	Geographical Area km^2	VDFs km^2	MDFs km^2	OFs km^2	Total Forest Cover km^2	Representative of Geographical Area (%)	Tree Cover km^2	Total Forest and Tree Cover km^2	Scrub km^2
1	50,362	8	806	1,023	1,837	3.65	1,592	3,429	33

(Source: FSI, 2019)

(a) Tree Outside Forests (TOFs)

Tree cover in small tree patches (<1 ha in extent) outside the recorded forest area and usually those lie in village woodlots, orchids, homesteads, urban areas, industrial plantations, and compact blocks along roads, canals, railway lines, etc. as well as scattered trees are of immense value as they provide multiple benefits. Owing to mapping limitations, isolated small tree patches (<1 ha) are excluded from 'Forest Cover', however, their contribution is captured in the form of tree cover. The State which was deficient in the actual forest cover had greater representation of tree cover to the extent of 1,592 km^2 (FSI, 2019) (Table 3.3).

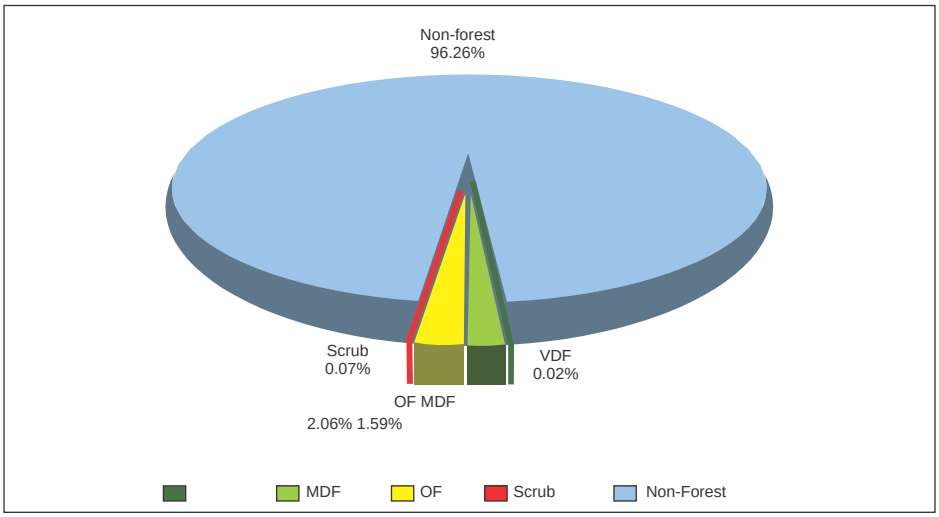


Fig. 3.4 - Forest Cover in Different Classes in Punjab State

(Source: FSI, 2019)

(b) Growing Stock

The ISFR-2019 also provided the insight on the growing stock in the RFA and TOF (Table 3.4). Punjab State had the growing stock in RFAs to the tune of 12.9 million m^3 while the State contributed 20.0 million m^3 of growing stock in TOF (FSI, 2019).

Table 3.4 - Growing Stock in Punjab

Sr. No.	Geographical Area of the State km^2	Recorded Forest Area km^2	% of India's Forest Area (%)	States' Geographical Area (%)	Growing Stock in RFA M m^3	Growing Stock in TOF M m^3
1	50,362	3,084	0.40	6.12	12.9	20.0

(Source: FSI, 2019)

Above revelations with regard to the lower extent of RFA, legal categories of forests, forest cover, representation of canopy density classes, and contribution to the growing stock of RFA and TOFs in Punjab noticeably explained that the overall situation of forests in the State is not very sound. These observations provide ample clues that there is enormous scope not only to enhance the forest extent in this State located along the course of Beas River, but also to improve the quality of forests.

(c) Spatial Pattern of Forest Cover and Fragmentation in Different Patch Size

Two consecutive biennial assessments on forest cover and patch characterization in Punjab also offered startling observations based on ISFR-2015 and ISFR-2017. In 2017, the State had a forest cover of 1,837 km^2 represented by 6,185 patches. There was just one large patch in the patch size range of 500 - ≤1000 km^2 constituting 30% of the total forest cover of the state (Table 3.5). As many as 98.39% patches were less than 1 km^2 and they constituted nearly 25% of the total forest cover in the State. There were just seven patches >10 km^2 those constituted 63.37% of the total forest cover. While comparing the situation of forest cover and patch characterization based on ISFR-2015, notable observations were: (a) an increase in number of forest patches from 5,161 to 6,185 with majority increase in the lowest patch size category (<1 km^2), (b) the contribution by singular largest patch to overall forest cover of the State decreased from 556 km^2 to 551 km^2 in two years of intervening period. The contribution of this patch to State forest cover decreased from 31.29% to 30% (FSI, 2015 and 2017). In one way, the situation of Punjab resembled to great extent with the overall country as they all showed the bulk proportion of patches in the smallest forest patch range class and greater pace of fragmentation of smaller patches.

Table 3.5 - Patch Size Classes in Punjab

Forest Cover Informatics in Different Patch Size Class							
Sr. No.	Patch Size Range (km^2)	ISFR – 2017			ISFR - 2019		
		No. of Patches	Area (km^2)	(%)	No. of Patches	Area (km^2)	(%)
1	0.01 - <1.0	5065	385	21.74	6,086	451	24.55
2	1.0 - <10	89	212	11.97	92	222	12.08

3	10 - <100	3	65	3.67	3	65	3.54
4	100 - <500	3	553	31.23	3	548	29.83
5	500 - ≤1000	1	556	31.29	1	551	30.00
6	**Total**	**5,161**	**1,771**	**100**	**6,185**	**1,837**	**100**

(Source: FSI, 2015 and 2017

(d) Forest Change in the State

The spatio-temporal changes in forest cover between two consecutive assessment periods reflect the change on the ground during the intervening period and provide an insight on the forest dynamics in human dominated landscape. A comparison of total forest cover and forest canopy density classes in two consecutive assessment periods (2017 and 2019) in the State provided noteworthy observations (Table 3.6). Accordingly, the State registered slight increase in forest cover in 2019 than the previous biennial assessment. There was no change in the extent of VDF between two consecutive assessments of 2017 and 2019. In case of MDFs, the State recorded slight decline in MDFs over two-year intervening period. The extent of Open Forests was enhanced in the State in comparison to the previous biennial assessment (Table 3.6).

Table 3.6 – Comparison in Forest Cover and Canopy Density Classes in Punjab State Between two Consecutive Assessments of 2017 and 2019

Sr. No.	Geographical Area km^2	2017 Assessment				2019 Assessment			
		Total Forest Cover km^2	**VDFs** km^2	**MDFs** km^2	**OFs** km^2	**Total Forest Cover** km^2	**VDFs** km^2	**MDFs** km^2	**OFs** km^2
1	50,362	1,837	8	806	1,023	1,849	8	801	1,040

(Source: FSI, 2017 and 2019)

(e) Changes in Forest Cover

The Forest Survey of India (FSI) has been carrying out biennial assessment on forest cover for the entire country and each of the State and UT since 1987. Thus, in past 16 consecutive assessments until 2019, valuable insight on changes in forest cover has been obtained. The same has been summarized in Table 3.7 for the State. Accordingly, the State showed gradual increase in forest cover since 1987 except an aberration between 2001 and 2005 when the forest cover decreased from 2,432 km^2 to 1,558 km^2 (Table 3.7).

Undoubtedly, the country as well as two concerned States showed gradual increase in forest cover in past 32 years. However, such increase in forest cover has to be seen with caution in connotation with the valuable insight on various forest canopy density classes, growing stock,

spatial patterns of forest cover, patch characterization, and the pace of fragmentation, particularly loss of smaller forest patches at a very fast pace. The forgoing description on changes in forest cover, the condition of the growing stock and the alarming rate of forest fragmentation warrants extensive as well as intensive forestry interventions so as to ensure healthy forests, efficient catchments, and sustainability of river ecosystems.

Table 3.7 – Comparison of Forest Cover in India and Punjab between 1987 and 2019

Sr. No.	Geographical Area km^2	Change in Total Forest Cover Since 1987 km^2							
		Assessment Year							
		1987	1991	1995	2001	2005	2011	2017	2019
1	50,362	943	1,343	1,342	2,432	1,558	1,764	1,837	1,849

(Source: FSI, 2017 and 2019)

3.2.7 Agro-ecosystem

Details on land use pattern in the State are provided in Table 3.8. Punjab with net area sown to the extent of 82.23% and cropping intensity of around 191% with over 99% of the cultivable area with assured irrigation holds place of pride among the Indian States for its outstanding achievements in agriculture as well as horticulture development (Table 3.8). The State comprising only 1.54% of the total geographical area of the country, contributes 13-14% towards the total food grain production of the country. The other categories i.e., land not available for cultivation and forests occupy 10.25% and 5.86% area, respectively. Besides these, the other categories are insignificant in Punjab and the land use categories show big imbalances for the State. For example, the extent of forests is very low as the stipulated (33%) or even in comparison to the country's recorded forest or forest cover. Presently natural resources especially water, soil and air of Punjab are degrading day by day, which is perhaps due to these imbalances in land use categories (Singh, 2015).

Table 3.8 - Land Use and Land Cover of Punjab

Land Use and Land Cover	Area in '000 ha	Percentage
Reporting area for Land Utilization	5,033	100
Forests	295	5.86
Not available for Cultivation	516	10.25
Permanent Pasture and Grazing land	7	0.14
Land under miscellaneous Tree Crops and Groves	5	0.10
Cultural Wasteland	3	0.06
Fallow land other than current fallow	0	0.00
Current fallows	37	0.74
Net area sown	4,169	82.83

Source: MoA, 2009

The 19th livestock census 2012 has reported a total livestock population of 8.12 million. The Livestock here includes mainly, cow, buffaloes, sheep, goat and pigs and are reared by virtually every family in the rural areas.

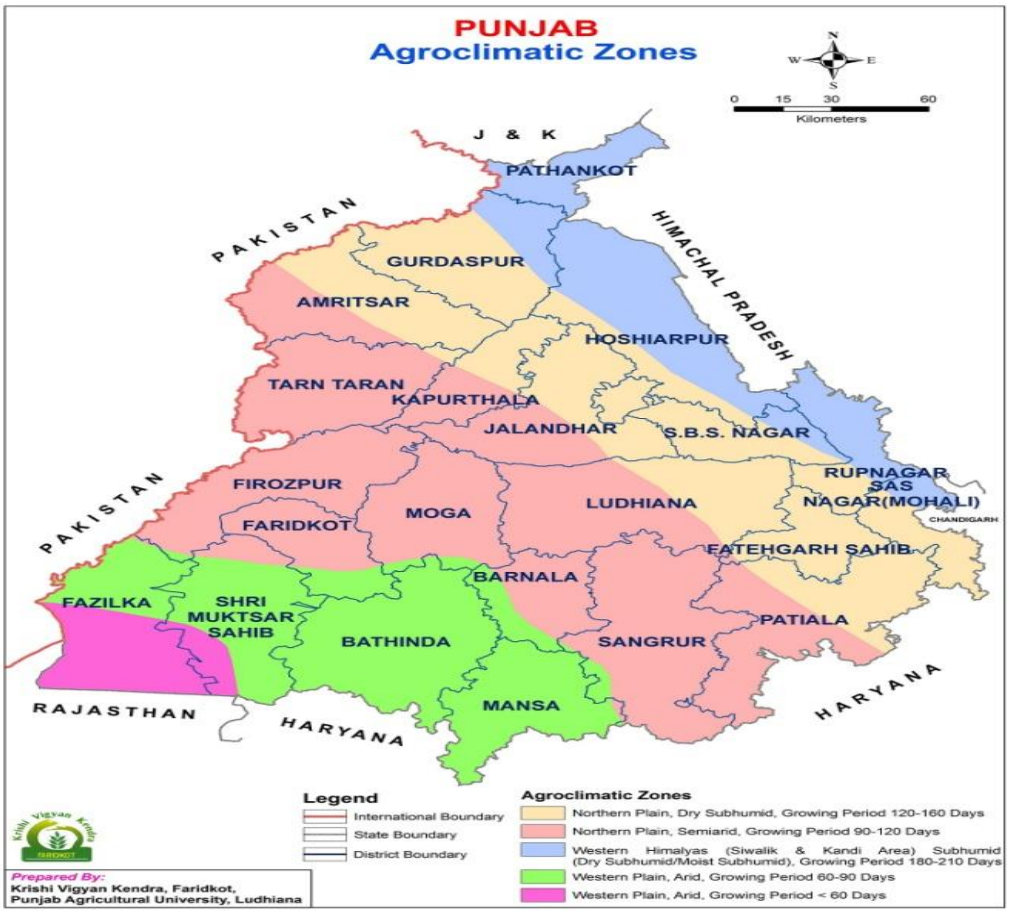


Fig. 3.5 - Agro-Climatic Zones of Punjab

3.2.8 Biodiversity

The plains in the state of Punjab do not have any thick forest; the only available patches are of grass, small bush and shrubs. The variety of angiosperms in the area includes 355 different species of herbs, trees of 70 different types, shrubs all in big and small sizes are of 70 different kinds, climbers of 19 types and 21 types of twines can be seen. Other than angiosperms, 31 kinds of pteridophytes and 27 species of bryophytes are found. Fauna includes 396 species of birds, 214 species of Lepidoptera, 55 species of fish, 20 species of reptiles and 19 species of mammals is found in the region. Wetlands of International importance in the state are Harike, Kanjli and Ropar wetlands. There are three major biodiversity ecosystems in the state – Shivalik Ecosystem, Wetland Ecosystem and Crop Land Ecosystem.

(A) Shivalik Ecosystem

The Shivalik Ecosystem, due to its rich fauna and flora has also been termed as the zone of micro-endemics in India. The Shivalik hill area of Punjab is spread over geographical area of 9448.97 Km^2 and lies in the north eastern part of the state extending from North West to south east along the Himachal Pradesh border.

(B) Wetland Ecosystem

The Wetland Ecosystem comprises of 12 natural wetlands and 9 manmade wetlands, covering an area of 8.39 Km^2 and 147.39 Km^2 respectively. Three of the wetlands of Harke, Kanjili and Ropar are recognised as Wetlands of International Significance under the Ramsar Convention, while Ranjit Sagar and Nangal Lake have been declared as National Wetlands.

(C) Cropland Ecosystem

Agriculture is practiced on 84 % of the total land area in Punjab. The State harbours a great deal of genetic variability, however it has been reduced over time due to change in the cropping pattern with main focus on wheat and paddy crop rotation. Increase in the area under paddy has led to decline in area under other major kharif crops namely natives like maize, jowar, bajra, sugarcane, groundnut, pulses, etc. Wheat cultivation is being done at the expense of gram, barley, rapeseed, mustard and sunflower. Due to this monoculture of wheat and paddy cultivation, the crop diversity has been reduced. As a result, the soil in the region has been degraded and also the underground water table has been considerably depletion. This has also led to resurgence and development of resistance in pests thus affecting the population of natural enemies of pests.

3.2.9 Demography

According to the last Census (2011), the population of the state is 2.77 Crore and a population density of 550 people per Km^2. The population comprises of 1.463 males and 1.310 females and the sex ration in the state is 893, with the literacy rate being 76.7 %. The rural and urban population constitute 62.52 % and 37.48 % respectively. Sikh are in majority in Punjab state. Sikh constitutes 57.69 % of Punjab population. Hinduism stands at 38.49 % of the total population, Christianity at 1.26 %, Jainism at 0.16% and Buddhism at 0.12% and others at 0.35 %. Punjab's demographic and social profile presents a unique human resource opportunity for economic growth through manpower skilling. As per KPMG (Auditing Agency) estimates, Punjab has a significant demographic dividend in the real term, with a rising working age population. Between 2012 and 2017, an additional 25.7 lakh are expected to reach the working age group population followed by another 23.2 lakh during 2017-22 (these are Gross numbers, without netting off retirees). Considering the past trends in labour participation rates of Punjab, the state would experience a gross addition of 11.3 lakh and 10.2 lakh population to labour force (i.e.

portion of the working age population willing to seek employment and work) during 2012-17 and 2017-22 periods respectively (Sharma and Nagaich, 2015).

3.3 Need for Forestry Interventions

The availability and quality of clean water in many regions of the world is increasingly threatened by overuse, misuse and pollution. The intricate relationship between forests and water has been of interest for long to natural resource professionals and policy makers. It is a common knowledge that forests not only influence the hydrological cycle but they also have an effect on water resources both quantitatively and qualitatively (FAO, 2013). Forests make their most significant contribution in supplying the water. Forests help in the stabilization of soils, minimize erosion, trapping sediments and pollutants from other up-slope land uses and activities. Forests can protect water bodies and water courses, increase intercepting of precipitation, decrease evaporation of moisture from vegetative surfaces, transpiring soil moisture and play role in capturing fog water and maintaining soil infiltration. Since, forests improve soil infiltration and soil water-storage capacity; hence they influence the timing of water delivery. Despite of providing wide range of services by forests, their role in the regulation of water flows and safe water supply is often overlooked, and not taken into account when developing policies or water management plans. Hence, there is need to recognize and consider forest and water interaction in the broader landscape in context of rivers.

3.4 Riverscape Analysis

3.4.1 Methodology

The Ravi River Basin occupying an area of 11,706.41 km^2 spreads across two north Indian States and one Union territory *viz*., Himachal Pradesh, Punjab and Jammu and Kashmir UT (Fig. 3.6). In the present assessment, image processing and GIS tools used were: ERDAS Imagine 2018, Geo-Media Professional 2018, ArcGIS, etc. The GIS software provided the tools needed to store, analyze and display geographic information. Landsat 8 Satellite Data (for the month of November, 2018) was used for preparation of Land Use/ Land Cover map of the riverscape. The Row, Path along with Date of Pass of the satellite data used in the present assessment for Punjab representing the downstream part of riverscape is presented in Table 3.9.

Table 3.9 - List of Data Downloaded and Used in the Present Assessment

State	Path	Row	Date of Pass	Satellite
Punjab	148	038	17-Nov-2018	Landsat-08
Punjab	149	038	08-Nov-2018	Landsat-08

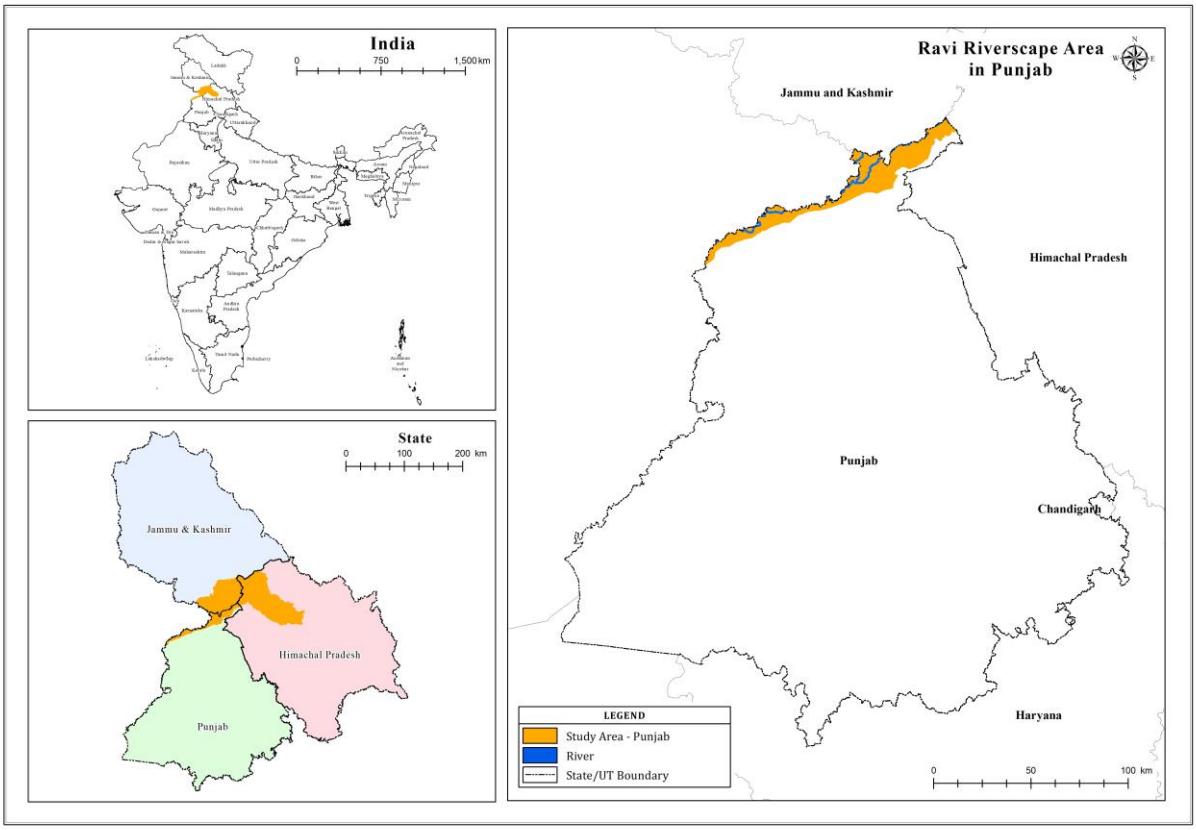


Fig. 3.6 - Ravi Riverscape Area in Punjab

3.4.2 Riverscape Profile

(A) Spatial extent

A small proportion (1161.7 km^2) or just 12.66% of the lower reaches of the riverscape only lies in Punjab while the larger proportion (87.34%) of the riverscape is located in Himachal Pradesh and Union Territory of Jammu and Kashmir (Table 3.10)**.** The Ravi River after traversing a distance of nearly 231.05 km in Himachal Pradesh and Jammu and Kshmi UT, descends into alluvium plains and travels a distance of 109.64 km in Punjab State entire area of all concerned micro-watersheds within Punjab covering an area of 1,161.7 km^2 was included in the riverscape keeping in view the fact that the water spread area during the high flood period had covered the extreme limits of relevant micro-watersheds. The riverscape area falls in Amritsar, Gurdaspur and Pathankot districts of Punjab. The select area of the Ravi Riverscape in Punjab includes the main stem and only one tributary i.e. Ujh which has catchment area of 566.52 km^2. Major cities, towns and villages situated on the banks of Ravi River and tributaries are Gurdaspur, Narot Jaimal Singh, Rakwal, Kamalpur, Sundergarh and Kassowala. The river forms international boundary between India and Pakistan while passing through Gurdaspur and Amritsar districts of Punjab and finally leaves Indian Territory at Goina/ Kakarmani village some 80 km away from Lahore city.

Details of the riverscape under consideration from the point of view of DPR i.e., the catchment, sub-catchment, watershed, sub-watershed and micro-watersheds of Ravi River is given in Fig. 3.7 to 3.11.

Table 3.10 - Details of the Geographical Area of Punjab in Ravi River Basin

Sr. No.	State	Geographical Area of State/UT (km^2)	Catchment Area	Representative Area included in Riverscape (km^2)	Geographical Coordinates		Representative Area of Riverscape (%)
					N (Lat.)	E (Long.)	
1	**Punjab**	50,362*	3,694.5	1,161.70	31°46'9.9"N to 32°30'50.2"N	74° 33'6.6"E to 75° 53'49.7"E	12.66

(*Source: FSI, 2019)

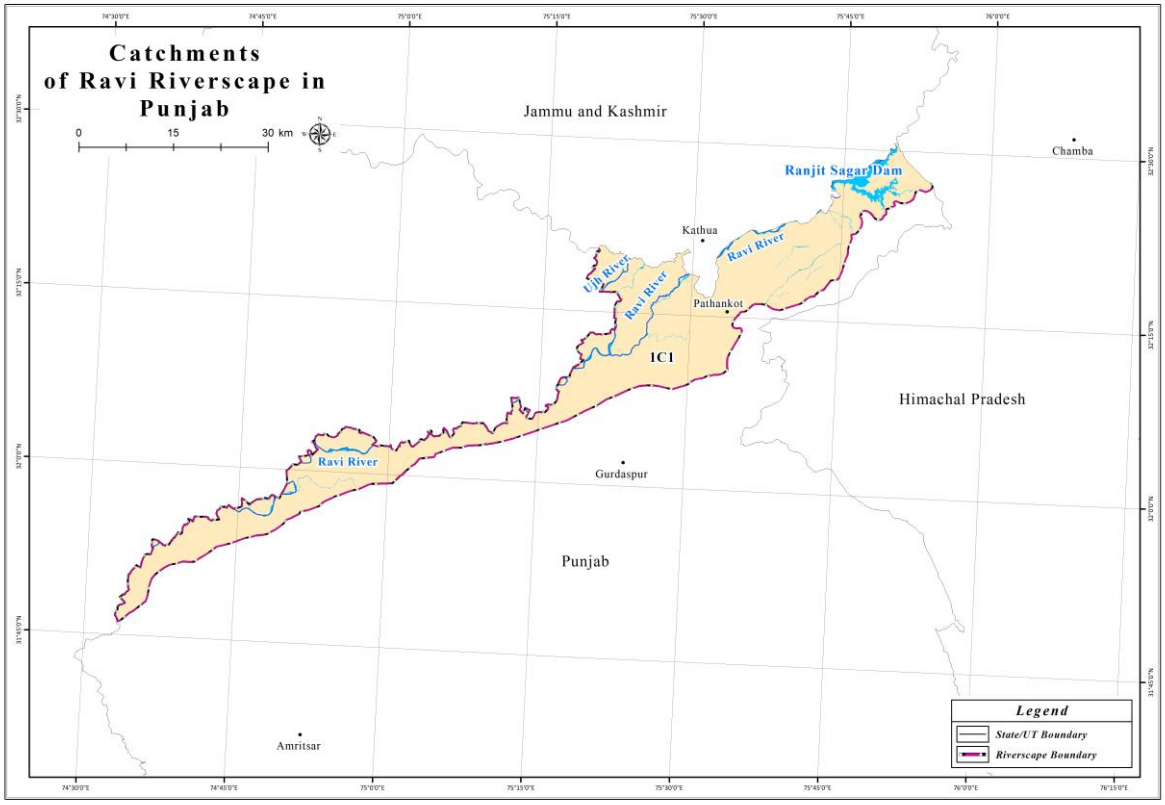


Fig. 3.7 - Catchment Area of Ravi Riverscape in Punjab

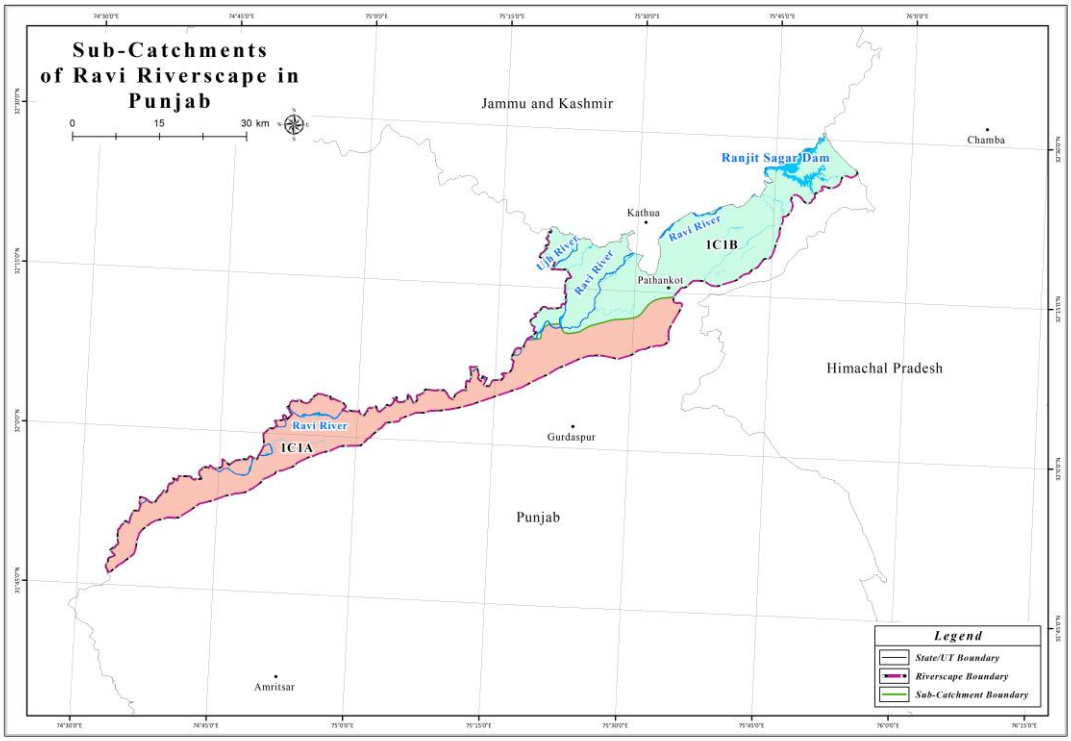


Fig. 3.8 - Sub-Catchment Area of Ravi Riverscape in Punjab

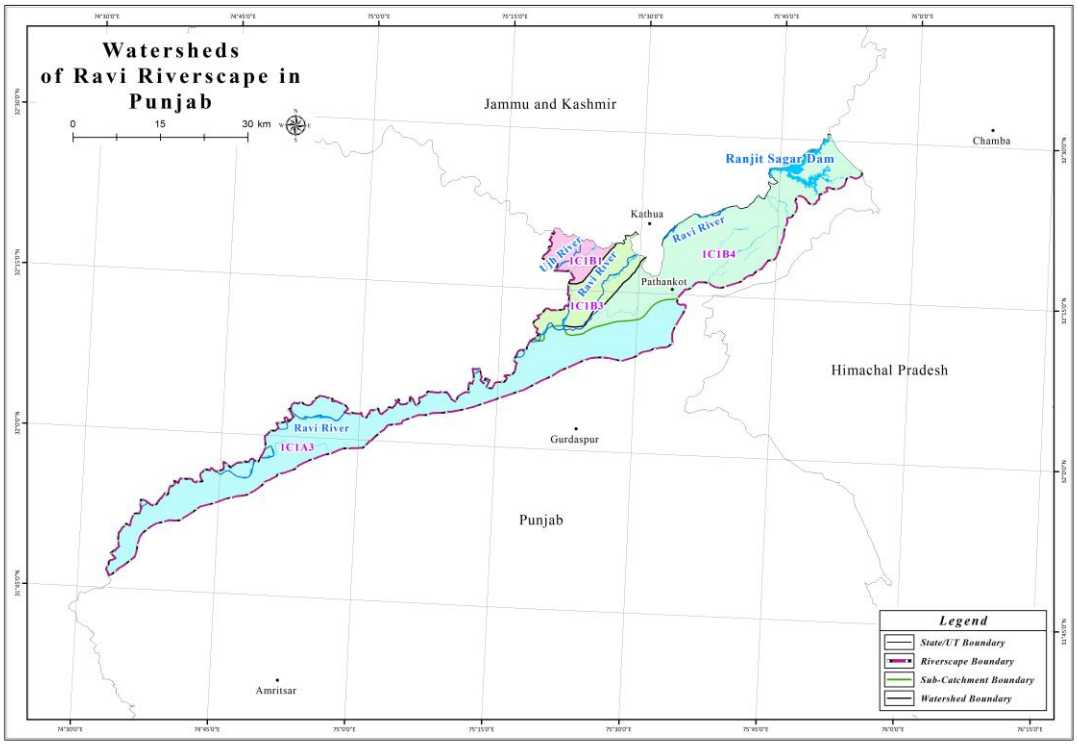


Fig. 3.9 - Watersheds of Ravi Riverscape in Punjab

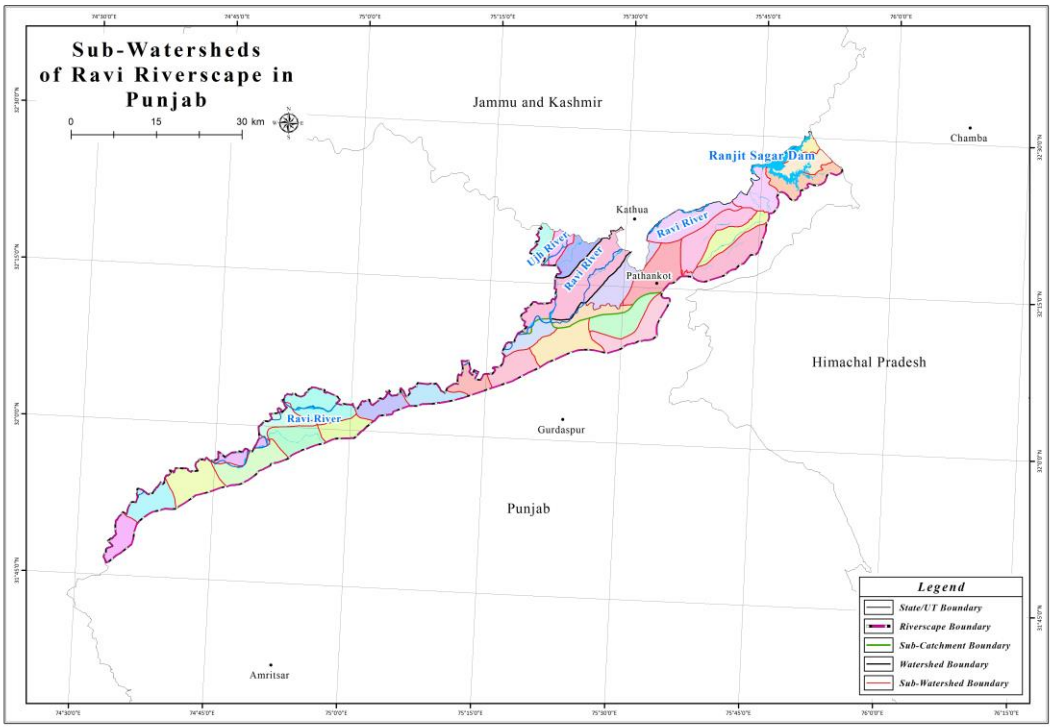


Fig. 3.10 - Sub-Watersheds of Ravi Riverscape in Punjab

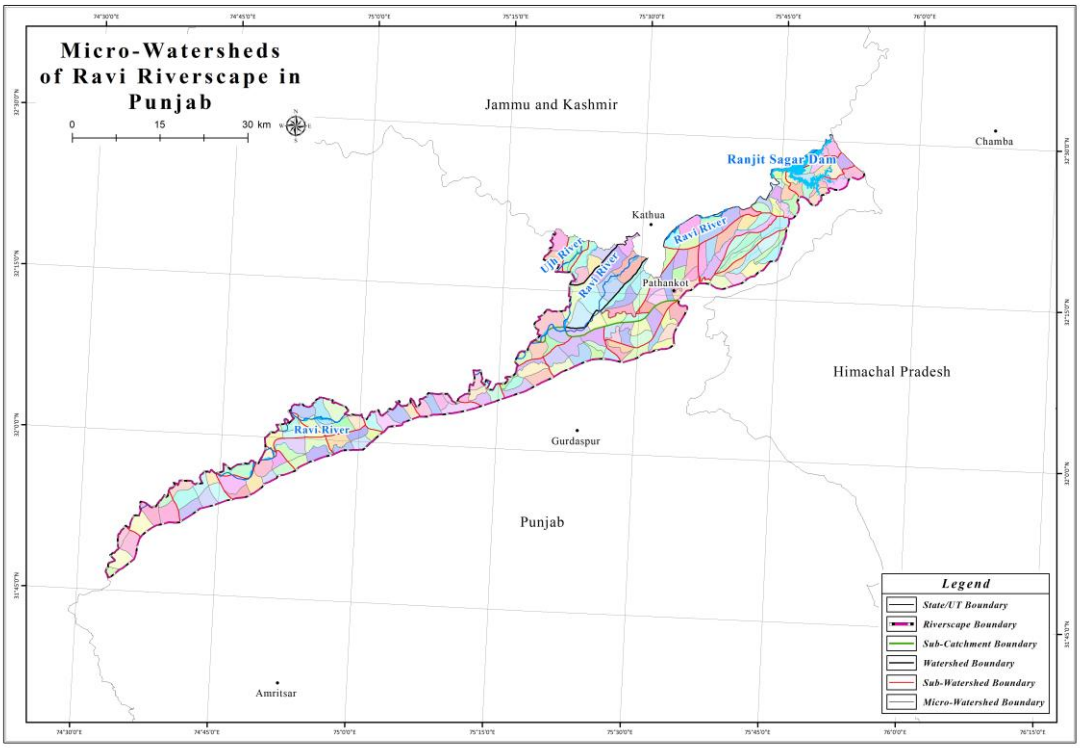


Fig. 3.11 - Micro-Watersheds of Ravi Riverscape in Punjab

(B) Land Use and Land Cover

A total of 12 major Land Use and Land Cover types i.e., Dense Forest, Moderately Dense Forest, Open Forest, Scrub, Barren, Settlement, Agriculture, Plantation, Water body, Canal, River (Perennial) and River (Dry)/ River sand have been delineated and mapped in the riverscape. The distribution of area under different land cover and land use classes is given in Table 3.11 and Fig. 3.12.

Table 3.11 - Distribution of Area under Different Land Use and Land Cover Categories in the Ravi Riverscape of Punjab

Sr. No.	LAND USE LAND COVER	AREA (ha)
1	Dense forest	3.67
2	Moderately Dense Forest	55.75
3	Open forest	36.00
4	Scrub	22.46
5	Barren	1.53
6	Settlement	53.08
7	Agriculture	920.74
8	Plantation	18.39
9	Water body	0.64
10	Canal	3.62
11	River (Perennial)	37.66
12	River (Dry)/ River sand	8.16
TOTAL		**1161.70**

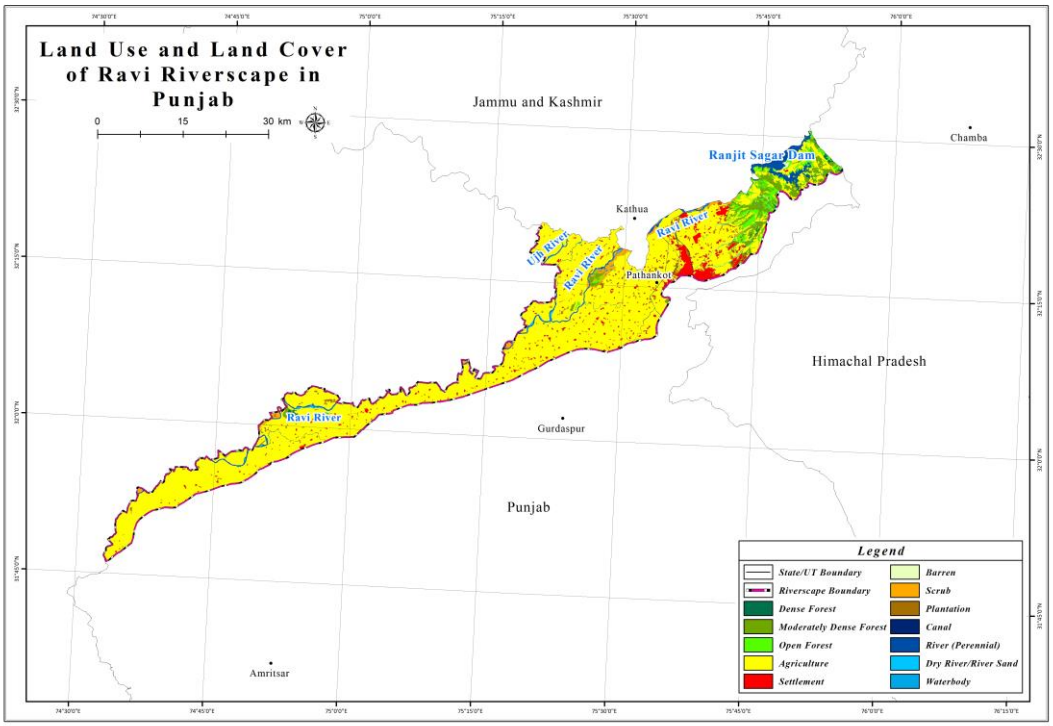


Fig. 3.12 - Land use and Land Cover Map of Ravi Riverscape in Punjab

(C) Elevation

The area in the riverscape within Punjab was grouped into 4 categories/classes. The distribution of areas under different elevation classes is given in Table 3.12 and Fig. 3.13.

Table 3.12 - Distribution of Area under Different Elevation Categories

Sr. No.	ELEVATION CLASSES	AREA (km^2)
1	< 250 m	819.84
2	250 - <500 m	259.16
3	500 - <750 m	80.39
4	750 - <1000 m	2.31
Total		**1161.70**

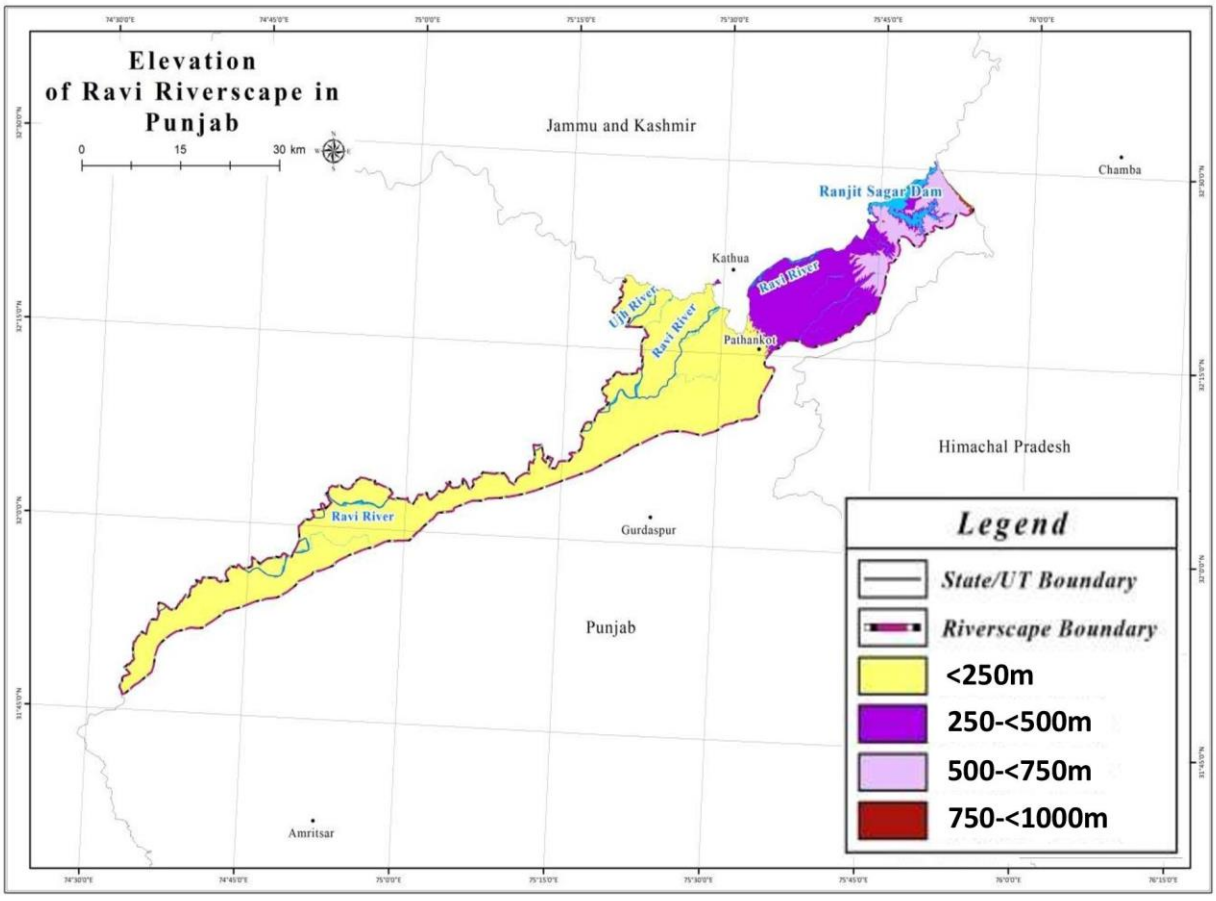


Fig. 3.13 - Elevation Map of Ravi Riverescape in Punjab

(D) Slope

Slope information is considered vital while suggesting suitability of areas for forestry interventions, particularly plantations. The higher degree of slopes (>30°) usually cause a lot of soil erosion and are prone to landslides, greater runoff, etc. Thus, areas with slopes >30° to 45° require safeguards from erosion while raising plantations of multiple values (fuel wood, fodder, small timber, etc.). A total of 10 classes of slope have been derived in the riverscape in Punjab. The distribution of areas under different slope classes is given in Table. 3.13 and Fig. 3.14.

Table 3.13 - Distribution of Area under Different Slope Categories

Sr. No.	SLOPE (^{0})	AREA (km^2)
1	< 2.5	704.24
2	2.5 to <5	291.83
3	5 to <10	91.99
4	10 to <15	35.35
5	15 to<20	23.53
6	20 to <25	8.70
7	25 to <30	3.94
8	30 to <35	1.48
9	35 to <40	0.47
10	≥ 40	0.17
Total		**1161.70**

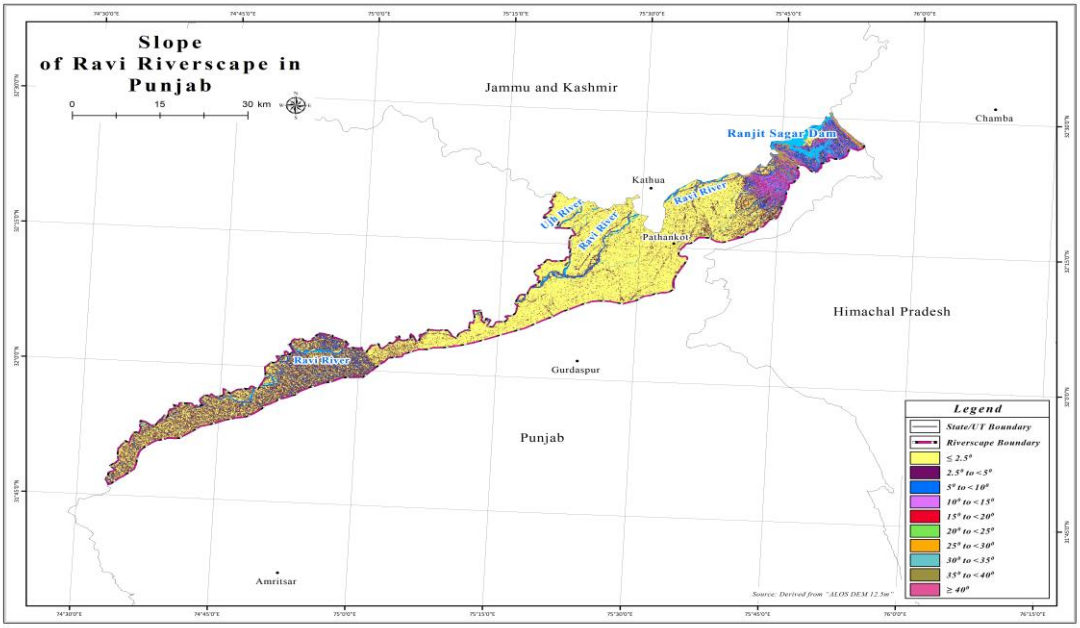


Fig. 3.14 - Slope Map of Ravi Riverscape in Punjab

(E) Aspect

The aspect map has been derived from the ALOS DEM. A total of nine categories viz., North, North-East, East, South-East, South, South-West, West, North-West and the Flat land has been analyzed in the study area in Punjab. The distribution of areas under different aspect classes is given in Table 3.14 and Fig. 3.15.

Table 3.14 - Distribution under Different Aspect Categories

Sr. No.	ASPECT	AREA (km^2)
1	Flat (-1)	231.31
2	North (0-<22.5,337.5-360)	105.61
3	Northeast (22.65-<67.5)	96.90
4	East (67.5-<112.5)	88.97
5	Southeast (112.5-<157.5)	120.84
6	South (157.5-<202.5)	118.92
7	Southwest (202.5-<247.5)	136.57
8	West (247.5-<292.5)	125.68
9	Northwest (292.5-<337.5)	136.90
	Total	**1161.70**

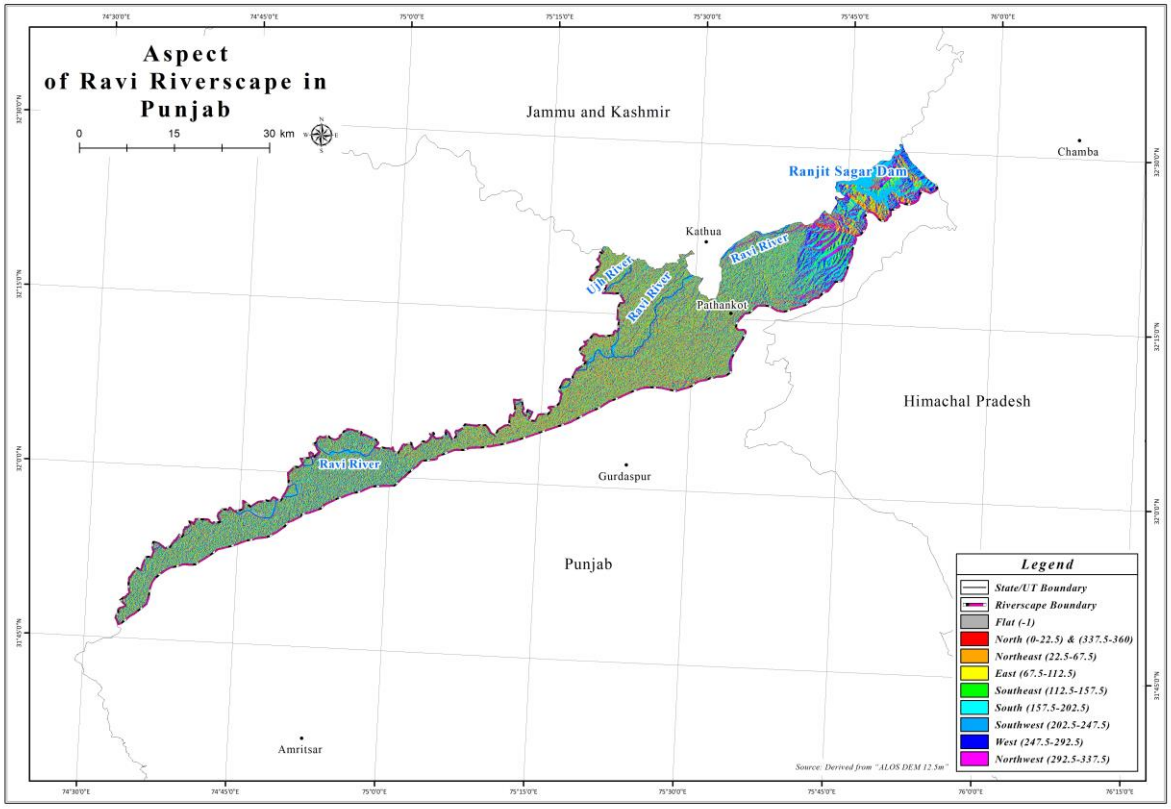


Fig. 3.15 - Aspect Map of Ravi Riverscape in Punjab

(F) Soil Type

Soil is considered as one of the most important parameter for modelling suitability of forest plantation zones. Since choice of species mainly depended upon the soil type and soil depth these parameters have been derived from Soil map prepared by NBSS-LUP for further use in modelling in the present study. A total of 7 soil type classes have been recorded in the riverscape in Punjab. Various soil types and their proportionate area estimates are given in Table 3.15 and Fig. 3.16. The soil type – Typic Ustifluvents was the most dominant soil type in the Ravi Riverscape in Punjab which was followed by Fluventic Eutrochrepts.

Table 3.15 - Distribution of Area under Different Soil Types and Other Land Attributes

Sr. No.	SOIL TYPE	AREA (km^2)
1	Dystric Eutrochrepts	168.84
2	Fluventic Eutrochrepts	231.20
3	Typic Eutrochrepts	107.13
4	Typic Ustifluvents	296.96
5	Typic Ustipsamment	137.56
6	Typic Ustochrepts	144.11
7	Udic Ustochrepts	0.04
8	Non – soil	75.86
	Total	**1161.70**

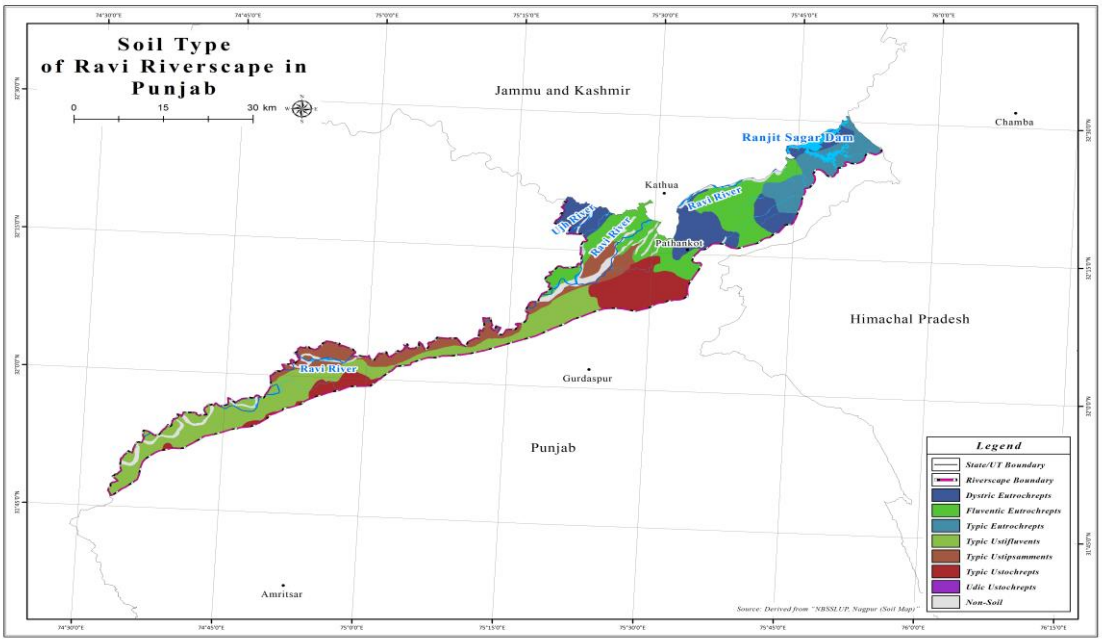


Fig. 3.16 - Soil Type Map of Ravi Riverscape in Punjab

(G) Soil Depth

Soil depth can greatly influence the type of plants that can grow in them. Deeper soils generally provide more water and nutrients to plants than more shallow soils. Soil depth is another important variable for suggesting suitability of tree species for a plantation. The depth

is important for the penetration of the roots of plant or tree species. Two depth classes, *vis.*, Deep, and Very Shallow have been mapped in Ravi Riverscape. The distribution of area under different soil depth classes is given in Table 3.16 and Fig. 3.17.

Table 3.16 - Distribution of Area under Different Soil Depth Categories

Sr. No.	SOIL DEPTH	AREA (km^2)
1	Deep	107.13
2	very deep	978.71
3	Non soil	75.86
	Total	**1161.70**

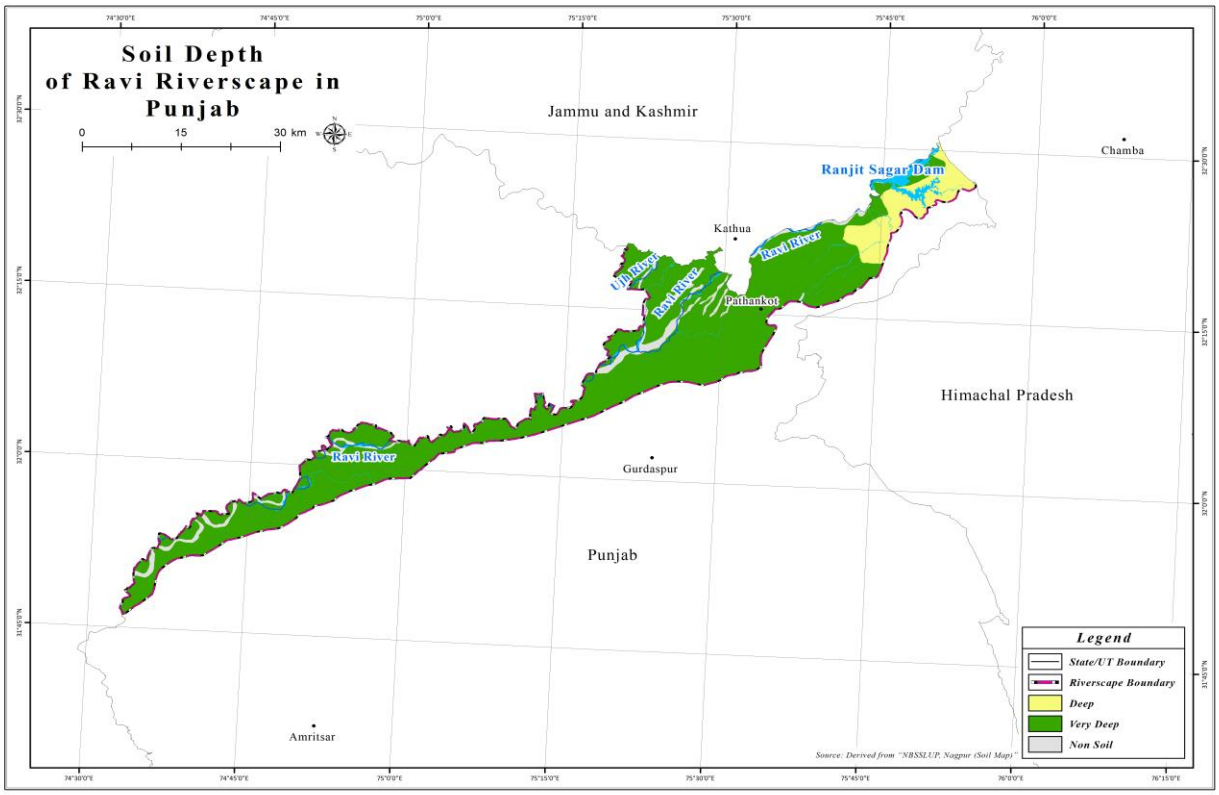


Fig. 3.17 - Soil Depth Map of Ravi Riverscape in Punjab

(H) Soil Erosion

Human activities caused by intensive Agriculture, Deforestation, construction/ widening of roads, construction of hydroelectric projects (HEPs), urban sprawl and erratic climatic conditions are some of the prominent factors responsible for soil erosion in the mountainous catchment of Ravi River. A total three categories of erosion classes have been mapped in the riverscape, *viz.*, 5 t ha^{-1} yr^{-1}; >5 t ha^{-1} yr^{-1} to <10 t ha^{-1} yr^{-1}; 10 t ha^{-1} yr^{-1} to ≤20 t ha^{-1} yr^{-1} . An area of 76.92 km^2 falls under non-soil category. These areas may not be suitable for forest plantations. The distribution of areas under different erosion classes and their area is given in Table 3.17 and Fig. 3.18.

Table 3.17 - Distribution of Area under Different Soil Erosion Categories

Sr. No.	SOIL EROSION	AREA (km^2)
1	<5	540.20
2	5-<10	224.11
3	10-≤20	320.47
4	Non soil	76.92
Total		**1161.70**

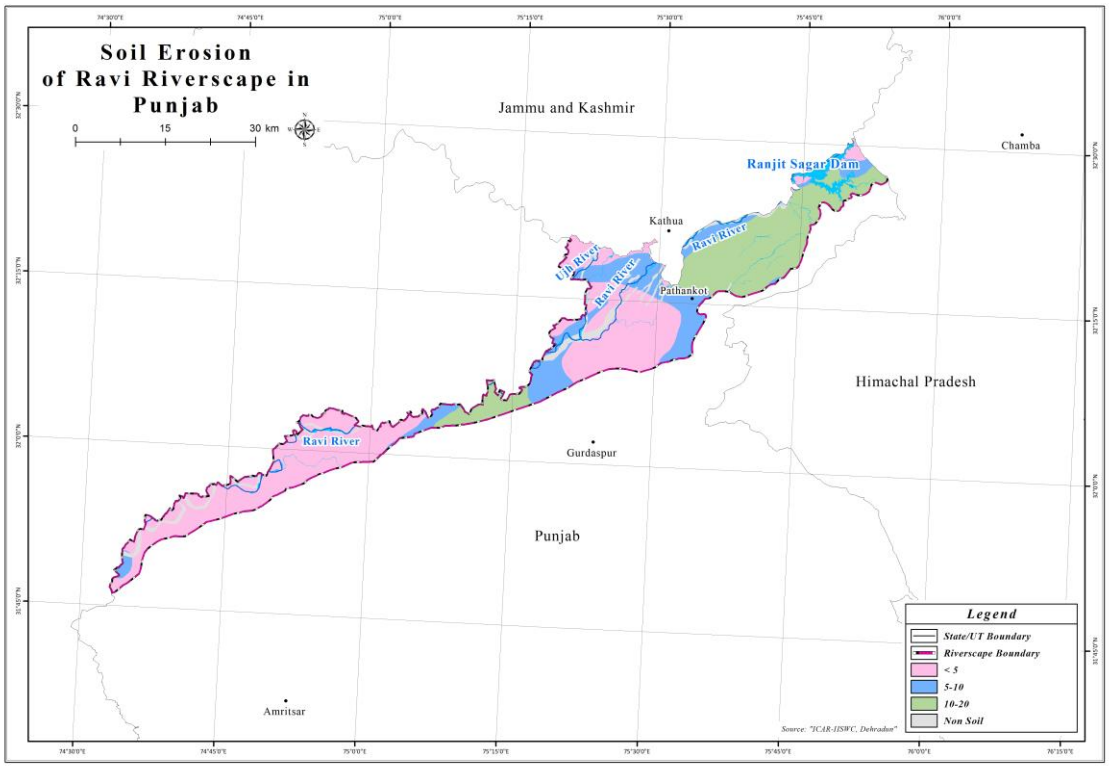


Fig. 3.18 - Soil Erosion Map of Ravi Riverscap in Punjab

(I) Forest Types

The vegetation type information is most important in suggesting suitable sites based on areas which do not have dense forest cover or which are falling in scrubs and grasslands along the river banks. Distribution of Area under Different Forest Types Categories is described in Table 3.18 and Fig. 3.19.

Table 3.18 - Distribution of Area under Different Forest Type Categories

Sr. No.	FOREST TYPES	AREA ($km^{2)}$
1	Tropical dry deciduous	78.21
2	Sub - tropical pine forests	17.21
3	Scrubs	22.46
4	Non forests	1043.82
Total		**1161.70**

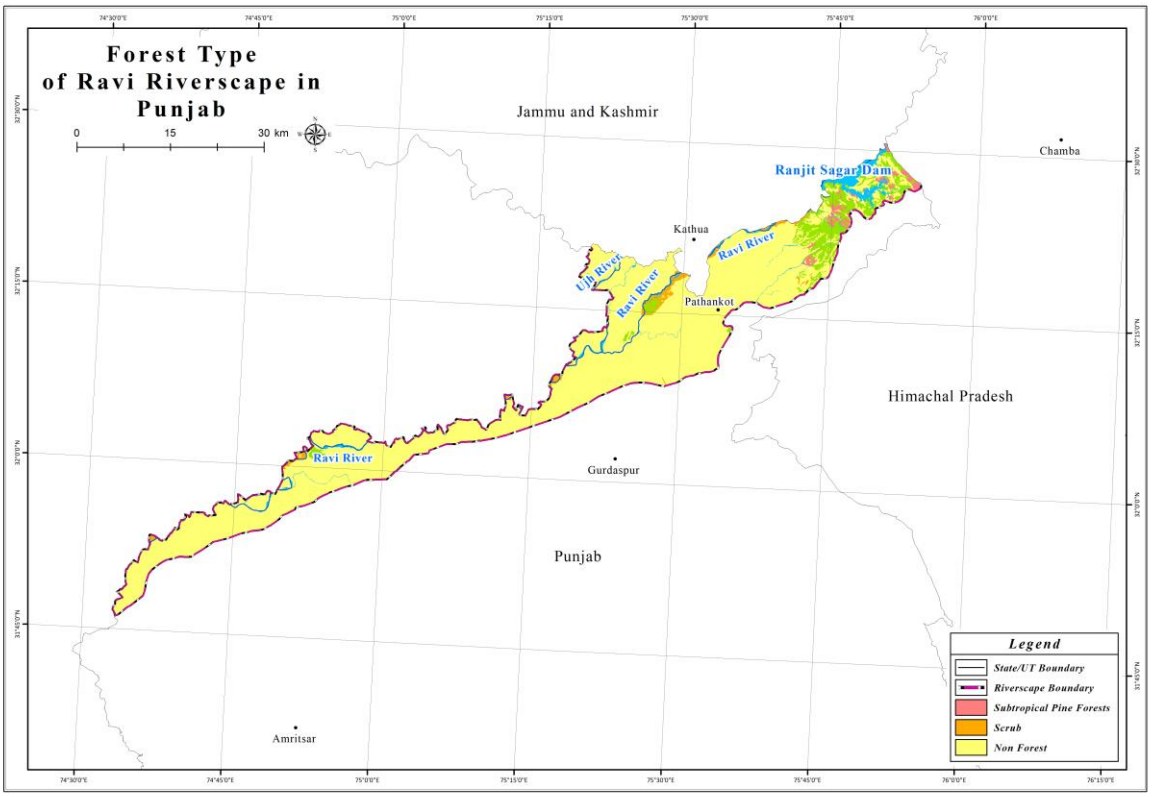


Fig. 3.19 - Forest Type Map of Ravi Riverscape in Punjab

(J) Forest Cover

The Non- forest area occupied the highest area of 1043.82km^2. Moderately Dense forests occupy 57.75 km^2 area in Punjab. Distribution of Area under Different Forest Cover Categories is described in Table 3.19 and Fig. 3.20.

Table 3.19 - Distribution of Area under Different Forest Cover Categories

Sr. No.	FOREST COVER	AREA (km^2)
1	Dense Forest	3.67
2	Moderately dense forest	55.75
3	Open forest	36.00
4	Non forest	1043.82
5	Scrub	22.46
	Total	**1161.70**

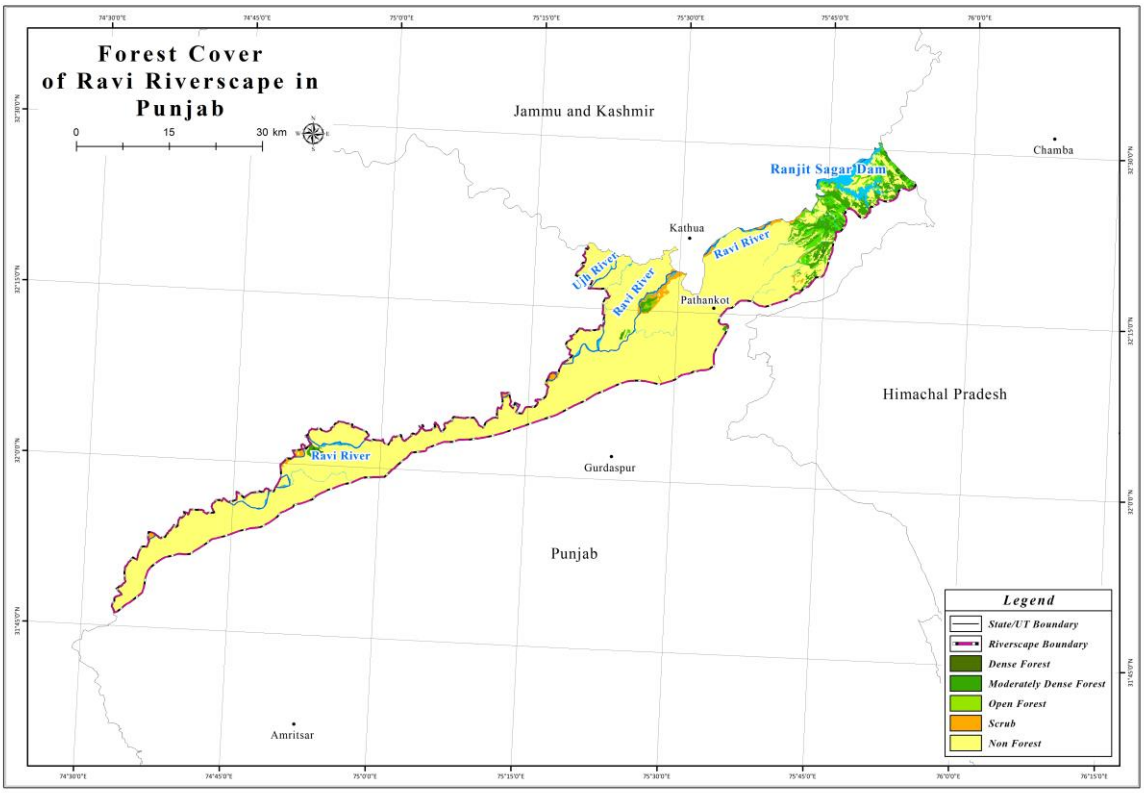


Fig. 3.20 - Forest Cover Map of Ravi Riverscape in Punjab

(K) Priority Treatment Area

For identifying priority areas in three priority categories, viz., 'High', 'Medium1 and 'Low' for the proposed treatments/forestry interventions in the Ravi Riverscape and selection of appropriate models, GIS-assisted geospatial analysis and modeling were used. Priority areas were delineated Punjab and described in Table 3.20 and Fig. 3.21.

Table 3.20 - Distribution of Area under Different Priority Categories

Sr. No.	PRIORITY TREATMENT AREA	AREA (km^2)
1	High	73.77
2	Low	622.95
3	Moderate	464.98
	Total	**1161.70**

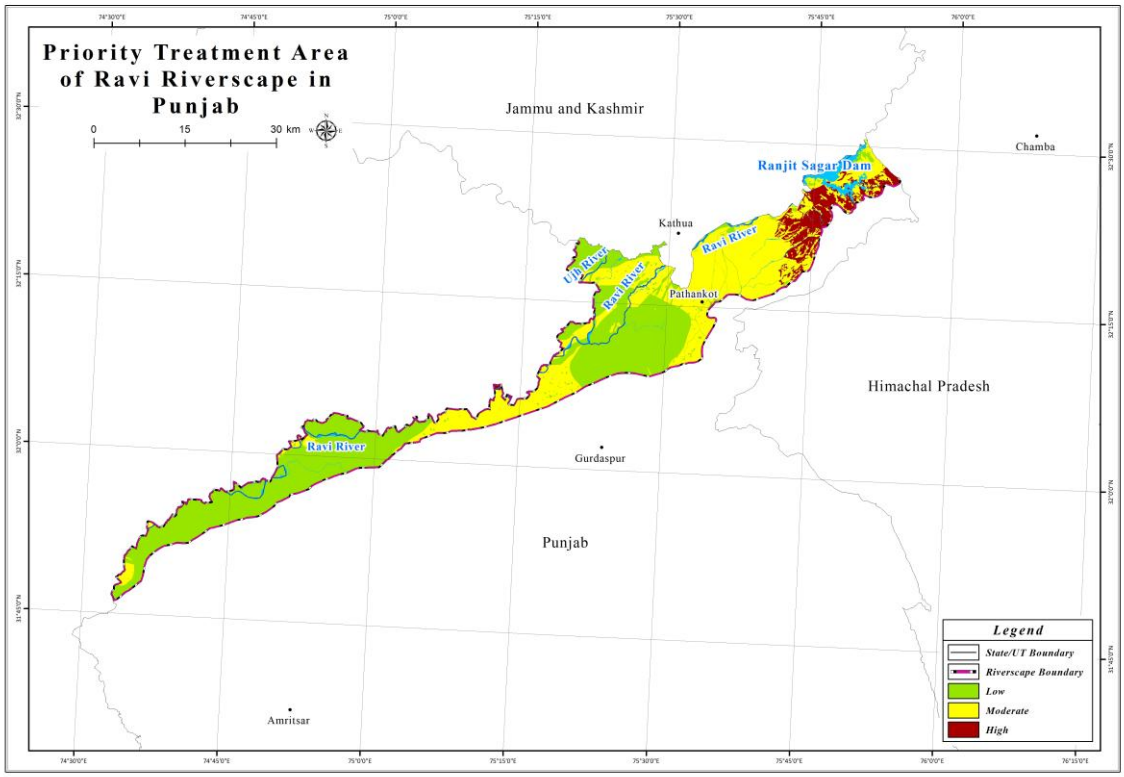


Fig. 3.21 - Priority Treatment Area Map of Ravi Riverscape in Punjab

3.5 Proposed Forestry Interventions

In general, following guidelines would be applicable to all proposed Plantation Models meant for three different Landscapesviz. Natural, Agriculture and Urban Landscape and Three types of Conservation Interventions viz. Soil & Water Conservation, Riverine and Riparian Management, and Wetland Management within the riverscape:

a) All the Models/ Interventions are prescribed which come under Forestry Interventions in proposed DPR of Rivers.

b) Native species of trees, shrubs, herbs and grasses would be selected for proposed treatment models/ plantations in consultation with stakeholders of the respective States/UT. Traditional and prominent horticultural and ornamental species those under cultivation in the region for quite sometime, are proposed in the Agriculture and Urban Landscapes. Mixed plantations are proposed as far as possible instead of monoculture for enhancing plant diversity and greater ecosystem services. The species are proposed according to their occurrence in the altitudinal zones however, Implementing Agencies may plant site specific species also.

c) Suitable native species suggested for different plantation models are finalized after due consultation with Forest Department and other stakeholders of concerned States/UTs. Native species proposed for plantation under each treatment models are provided in the following section. In addition, landscape-wise model description has been further supplemented with the species-wise attributes and model-wise listing in Annexure 3 and Annexure 4, respectively

d) The necessary preparations for planting works including digging of pits would be completed two-three months before the onset of monsoon or planting season. However, the period between pit digging and scheduled planting time would not be more than four months so that run-off of soil by wind and water could be minimized.
e) Appropriate quantity of farmyard or organic manure or AM would be applied to boost plant growth in nurseries and plantation sites. Eco-friendly measures (i.e. physical or mechanical methods, use of natural products, etc.) for weed and pest control would be adopted without resorting to the use of synthetic chemicals
f) Plantation sites would be protected against all types of biotic disturbances and abiotic stresses so as to effectively safeguard planted material for three years through fence, watch and ward, as well as local public awareness programmes and their active involvement.
g) The Implementing Agency should either develop modern and centralized nurseries or identify various certified Research Institutes, Universities, NGOs, Institutions and progressive farmers for supply of best quality planting material.
h) The Schedule of Rates (SoR) is adopted from prevailing SoR of respective States/UTs. For Himachal Pradesh, SoR of Shimla Forest Circle for the year 2012-13 @ wage rate of Rs.150/ with increase of 66.66% i.e., Rs. 250/-, for J&K UT SoR of 2017 @ Rs. 225/- has been applied. Also an increase of 7% has been added each year i.e., 2nd year onwards to compensate inflation.
i) The budget will be provided after submission of Annual Plan Operations (APO) for each year. So the prevailing wage rate will be applicable whenever DPR is implemented. Also site can be changed as per the availability at the time of implementation wherever required.
j) In Himachal Pradesh, further 25% hike in wage rates would be applied for Tribal Areas
k) The fencing cost has been calculated on average basis of enclosure of area to the extent of 5 hectare and average carriage lead is taken as 1 km (up & down)
l) The nursery time for plants in multitier model is taken on average basis i.e., 1.5 – 4.5 year so average is 3 years, for calculating the norm. Also the plant cost is taken from the norm prescribed by the Forest Department of respective States.
m) These cost Norms indicate the upper limits. The expenditure will be booked under various items shown in the detailed models as per actual work done in the field as per Schedule of Labour rates of the respective States/UTs and will not exceed these Departmental Norms.
n) The suggestive cost models are to create multistoried forest cover for improving the bio-diversity of the area which in turn conserves the water and soil in-situ.
o) In *Lantana* eradication models or wherever Lantana removal is involved, the Cut Root Stock (CRS) method should be adopted.
p) The fencing work includes the 4-strands of barbered wire with interlacing of thorny bushes.
q) In Fire Protection Model, as area is virtually targeted, hence Implementing Agency should rotate fire protection operations in areas of the Division so that each selected area takes operations after 3 years.

r) In Agriculture models the guidelines of Sub-Mission on Agroforestry (SMAF) of Central Government should be considered as being adopted in States and UT.
s) Under Urban Landscapse, the Seechewal Model (Punjab) for bio-remediation and bio-filteration may be taken into consideration.
t) Also in Urban Landscape, Eco-Park Development, Institutional Plantation and Riverfront Development models can be converged with Nagar Van Yojna as launched by GoI.
u) In Soil and water conservation models, the watershed approach and techniques should be adopted for desired results. For this intervention the Annual Plan Operation (APO) should be submitted each year with the proposal of micro plan of specific sites with detailed estimates.
v) In Riverine and Riparian Management and Wetland Management models, areas shown in budgetary provisions are virtual and concerned Implementing Agency (IA) should clearly mention the proposed activities in Annual Plan operation (APO) to be taken up in particular area with detailed microplan and estimates.
w) Plantation models are for the general areas as proposed by the Territorial Divisions but for the protected areas, two models under Conservation Intervention *viz*. Riverine and Riparian Management and Wetland Management are propsed.
x) The prescribed models, identified sites, area of the sites, species and rates may be modified to suit local conditions at the time of implementation of project and the concerned conservators of forests shall exercise the power to approve such changes as and when requires.
y) **Cost Indexing:** The project costs have been worked out on the basis of rate prevalent during year 2019-20 in the respective State/UTs and 7% escalation in the project cost during the subsequent years has been incorporated in anticipation of the cost escalation in future. However, actual project cost at the time of implementation on yearly basis shall need revision as per the change in Wholesale Price Index (WPI) on year to year basis. The Conservator of Forest may be empowered to revise the project cost accordingly for the quality desired output of the project.

3.5.1 Natural Landscapes

Treatment models for Natural Landscapes were proposed in plains of Punjab. Elaborate details on various treatment models included in the present DPR is presented in the following section.

Model-Wise Treatment Plans under Three Lower Order Zones

The treatment plans for 8 proposed models (Natural-02, Agriculture-02, and Urban-04) meant for three Lower Order Zones or Landscapes (i.e., Natural, Agriculture and Urban) within the riverscape are elaborated below.

Treatment Models for Natural Landscape in Punjab

The Chapter on river and its environment has highlighted the existing situation of forests in the alluvial plains of Punjab and also elaborated on challenges faced by extremely small extent of forests owing to the fact that the entire tract is heavily populated as well as extensively cultivated. In view of this, the following forestry interventions by way of different treatment models are proposed. Details of these two treatment models prescribed in the natural landscape of Punjab are presented below one by one in Table 3.21.

Table 3.21 - Models proposed in Natural Landscape

Model number	Name of Model	Brief Description
RV/PB/NL/01	**Restoration of Degraded Forests Model**	This model is specifically proposed for restoration of degraded protected forests or plantation in village common lands or community lands. Proposed sites are mostly flat and covered either with shrubs/ herbs/ grasses or invasive and alien species. Often such areas are inhabited by Nilgai or wild pig and locally abundant populations of these two herbivore species could be a menace to proposed plantation activities. Moreover, such sites also face severe biotic pressure by way of livestock grazing, and collection of fodder and fuel wood. Hence, effective fencing of sites selected for proposed forestry interventions is a pre-requisite so as to ensure full protection to young plantations. Heavy monsoon rains cause severe siltation in Ravi River and resultant flooding in Punjab plains. Suitable and effective forestry interventions in above sites can immensely help in improvement of vegetation cover, checking soil erosion, and enhancing groundwater recharge. Block plantations of native broadleaved species are proposed for such areas. Trees will be planted at the rate of 1,000 plants ha^{-1} at 3 m x 3 m spacing. Pit size of 50 cm x 50 cm x 40 cm will be used for proposed plantations under this model. After land development, pit digging, etc. plants mainly of broadleaved species like *Acacia nilotica*, *Dalbergia sissoo*, *Senegalia catechu*, *Melia composita*, *Ailanthus excelsa*, *Toona ciliata*, *Morus alba*, *Alstonia scholaris*, *Terminalia arjuna*, *Tectona grandis*, *Azadirachta indica*, *Ficus racemosa*, etc. will be planted. Conservation and other management practices as prescribed in the Forest Working Plan of the respective Forest Division would be applicable. Nursery of selected tree species will be established during first year and [planting will be done in the second year. Subsequently, the plantations will be managed during next three year of the project.

RV/PB/NL/02	**Road Side Plantation**	This model is specifically proposed for the purpose of road side plantations. Hence, proposed plantations will be in narrow strips along the roads. Generally, proposed sites along the roads are either sparsely covered by native vegetation or select invasive alien species or often blank. Stray cattle as well as wild animals like Nilgai and wild pig could be a menace to proposed plantations. Hence, effective fencing of sites proposed for plantation is a pre-requisite. The proposed road side plantations would help in enhancing the forest cover in a State which is otherwise deficient in natural vegetative cover besides checking soil erosion and runoff. Strip plantations on both sides of the road are proposed. The planting area will be cleaned and one row of shrubs is proposed at 1 m x 1 m spacing towards the road side. Fast growing ornamental shrubs are proposed. Two rows of native broadleaved trees are recommended under this roadside plantation model at 3 m x 2 m spacing. Pit size of 45 cm x 45 cm x 45 cm will be used for plantation. After land development, pit digging, etc. plants mainly of broadleaved species *viz*., *Dalbergia sissoo*, *Terminalia bellirica*, *Terminalia chebula*, *Terminalia arjuna*, *Melia azedarach*, *Acacia nilotica*, *Azadirachta indica*, *Anthocephalus cadamba*, *Ailanthus excelsa*, *Toona ciliata*, etc., will be planted. Nursery of selected tree species will be established during the first year and planting will be done in the second year. Subsequently the plantation will be managed during next three year of the project.

Table 3.22 - List of Species for Plantation

Model number	Name of Model	Species for plantation
RV/PB/NL/01	**Restoration of Degraded Forests Model**	**Trees:** *Acacia nilotica, A. catechu, Dalbergia sissoo, Melia composita, Ailanthus excelsa, Toona ciliata, Tectona grandis, Azadirachta indica, Cordia myxa, Morus alba, Pongamia pinnata, Bombax ceiba, Aegle marmelos, Pterocarpus marsupium, Grewia elastica, Cassia fistula, Moringa oleifera, Butea monosperma, Santalum album, Tamarindus indica, Ziziphus mauritiana*, etc.
RV/PB/NL/02	**Road Side Plantation**	**Trees:** *Dalbergia sissoo*, *Terminalia* spp., *Melia composita*, *Acacia nilotica*, *Albizia* spp., *Butea monosperma*, *Azadirachta indica*, *Anthocephalus cadamba*, *Ailanthus excelsa*, *Toona ciliata*, *Jacaranda mimosifolia*, *Grevillea robusta*, *Salix* spp., etc.

		Shrubs: *Bougainvillea* spp., *Rosa* spp., *Nerium indicum*, *Nyctanthes arbor-tristis*, *Spiraea* spp., *Maesa indica*, *Woodfordia fruticosa*, etc.

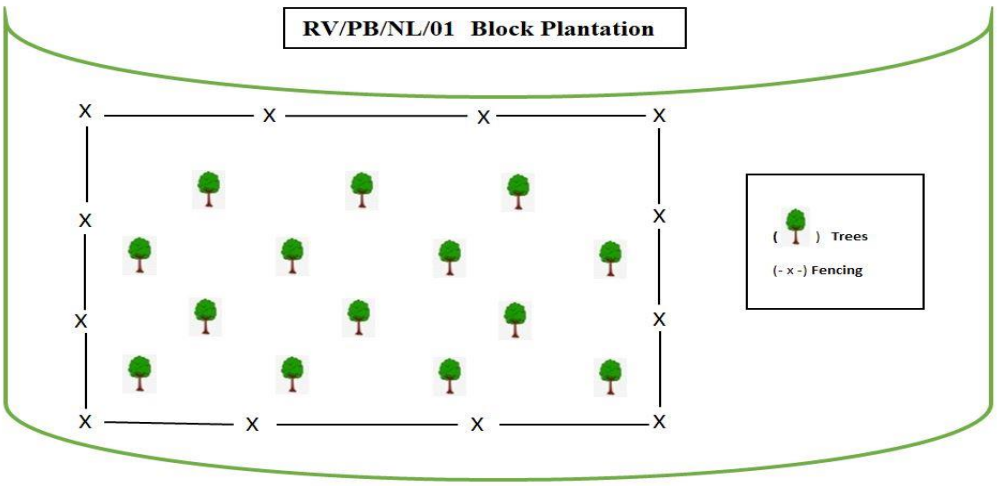


Fig. 3.22 – RV/PB/NL/01 Block Plantation

Trees: 800-1,000 No., Spacing (m) – 3 x 3, Pit size (cm) – 50 x 50 x 40
Fencing: Cement pole/ local material-wood/ branches /brushwood fencing

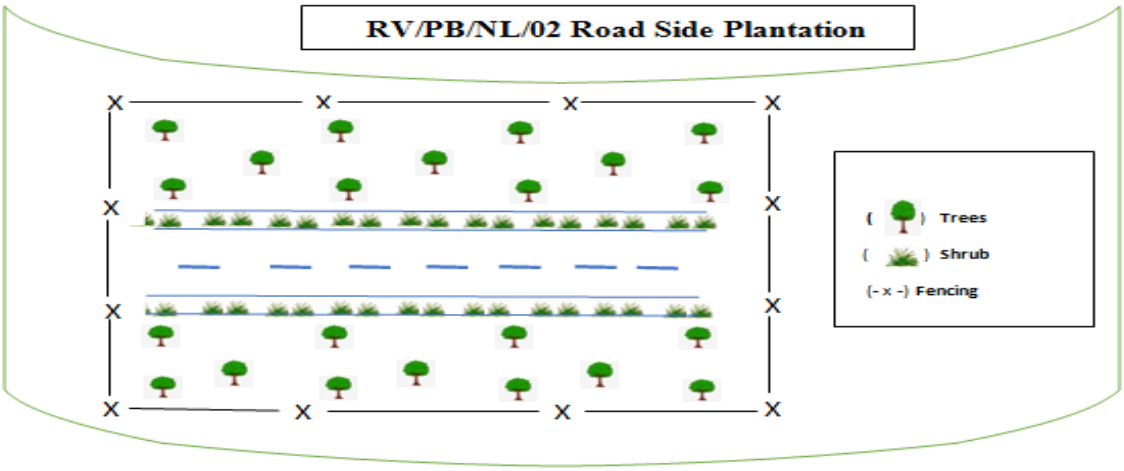


Fig. 3.23 – RV/PB/NL/02Road Side Plantation

Trees: 1,000 No., Spacing (m) - 3 x 3, Pit size (cm) – 50 x 50 x 40
Shrubs: 2,500 No, Spacing (m) - 2 x 2, Pit size (cm) – 30 x 30 x 30
Fencing: Cement pole/ local material-wood/ branches/ brushwood fencing

Table 3.23 - Cost Norms for RV/PB/NL/01Restoration of Degraded Forests Model

Labour Rate Rs. 342/day in Ist year and Annual Increase @ 7% in Subsequent Years				
Year	**Item**	**Detail of work**	**Amount/ha (Rs)**	**Tentative Man days**
	Number of Plants (No.)	Plants- 1000 No.		
1st Year	Nursery Advance Work Labour Cost	Cost of seedlings including (a) Original planting =1000 per ha (b) Replacement 10%= 100 per ha Total 1100 No. in Bio-degradable polybag.	16,115	47
2nd year	Advance Work Labour Cost	Cutting of *Lantana*/Mallah etc., Kana stubbing, Survey and alignment Earth work i.e., digging of pit of size, a) 1000 no x .5m x0.5mx 0.40m, Refilling of pits and Fencing (5% of plantation cost).	25,100	70
3rd Year	Creation	Carriage of Plants, Lay out of pits and patches, Pitting & Planting of plants, Weeding hoeing (twice),Application of insecticides, Application of FYM/ fertilizers(twice), Providing thorny protection to plants against Porcupine attack, Covering and uncovering of frost tender plant species (25%), Preparation of inspection path, Watch and ward for every 10 ha of plantation, Cutting of *Lantana*/mallah IInd and IIIrd times, Spot Irrigation (8+1 times), Reopening of trenches and pits, Insecticides including carriage, Fertilizers i.e., urea, etc. including carriage, Overhead charges (10% of planation cost) POL, OE and Miscellaneous.	1,10,424	305
Total Establishment Cost (Rs.) =			**1,51,639**	**422**
MAINTENANCE				
4th year	Maintenance Cost - I Year i/c Material	Cost of seedlings (25%), Cutting of *Lantana*/Mallah etc., Kana stubbing, Earth work i.e., re-digging of pit Refilling of pits, (25%) Fencing (5% of plantation cost), Carriage of plants, Weeding hoeing (twice),Application of insecticides, Application of FYM/ fertilizers(twice), Providing thorny protection to plants against Porcupine attack, Covering and uncovering of frost tender plant species (25%), Maintenance of inspection path, Watch and ward for every 10 ha. of plantation, Spot Irrigation (8+1 times), Reopening of Trenches and pits, Insecticides including carriage, Fertilizers i.e., urea, etc. including carriage, Overhead charges (10% of maintenance of planation cost) POL, OE and Miscellaneous.	51,534	118

5thyear	Maintenance Cost - II Year	Earth work i.e., re-digging of pit Refilling of pits, (15%) Fencing (5% of plantation cost), Carriage of plants, Weeding, hoeing (twice), Application of insecticides, Application of FYM/ fertilizers(twice), Providing thorny protection to plants against Porcupine attack, Covering and uncovering of frost tender plant species (25%), Maintenance of inspection path, Watch and ward for every 10 ha. of plantation, Spot Irrigation (8+1 times), Reopening of trenches and pits, Insecticides including carriage, Fertilizers i.e., urea, etc. including carriage, Overhead charges (10% of maintenance of planation cost) POL, OE and Miscellaneous.	21,346	41
6th year	Maintenance Cost - III Year	Weeding hoeing (twice),Application of insecticides, Application of FYM/ fertilizers (twice), Providing thorny protection to plants against Porcupine attack, Watch and ward for every 10 ha of plantation, Fertilizers i.e., urea, etc. including carriage, Overhead charges (10% of maintenance of planation cost) POL, OE and Miscellaneous.	7394	10
Total Maintenance Cost (Rs.) =			**80,274**	**169**
Total cost of Plantation (Rs.) =			**231,913**	**591**

Table 3.24 - Cost Norms for RV/PB/NL/02Road Side Plantation

Year	Item	Detail of works	Amount/ Ha (Rs)	Tentative Man days
	Number of Plants (No.)	Plants- 1000 No., Herbs- 2500.		
1st Year	Nursery Advance Work Labour Cost	Cost of seedlings including (a) Original planting =3500 per ha (b) Replacement 10%= 350 per ha Total 1100 No. in Bio-degradable polybag Cost of Herbs - (a) Original planting =2500 per ha (b) Replacement 10%= 250 per ha Total 2750 No. in Bio-degradable polybag (Ist year).	38115	111
2nd year	Advance Work Labour Cost	Cutting of *Lantana*/Mallah etc., Kana stubbing, Survey and alignment Earth work i.e., Digging of pit of size a) 1000 no x .5m x0.5mx 0.40m, b) 2500 no. Spacing (m) - 2 x 2, Pit size (cm) –	52361	119

		30 x 30 x 30, Refilling of pits, Fencing (5% of plantation cost).		
3rd Year	Creation	Carriage of plants, Lay out of pits and patches, Pitting & Planting of plants, Weeding hoeing (twice),Application of insecticides, Application of FYM/ fertilizers (twice), Providing thorny protection to plants against Porcupine attack, Covering and uncovering of frost tender plant species (25%), Preparation of inspection path, Watch and ward for every 10 ha. of plantation, Cutting of *Lantana*/mallah IInd and IIIrd times, Spot Irrigation (8+1 times), Reopening of trenches and pits, Insecticides including carriage, Fertilizers i.e., urea, etc. including carriage, Overhead charges (10% of plantation cost) POL, OE and Miscellaneous.	180376	442
Total Establishment Cost (Rs.) =			**2,70,852**	**672**
		MAINTENANCE		
4th year	Maintenance Cost - I Year i/c Material	Cost of seedlings (25%), Cutting of *Lantana*/Mallah, etc., Kana stubbing, Earth work i.e., re-digging of pit Refilling of pits, (25%) Fencing (5% of plantation cost), Carriage of plants, Weeding, hoeing (twice), Application of insecticides, Application of FYM/ fertilizers(twice), Providing thorny protection to plants against Porcupine attack, Covering and uncovering of frost tender plant species (25%), Maintenance of inspection path, Watch and ward for every 10 ha of plantation, Spot Irrigation (8+1 times), Reopening of Trenches and pits, Insecticides including carriage, Fertilizers i.e., urea, etc. including carriage, Overhead charges (10% of maintenance of plantation cost) POL, OE and Miscellaneous.	125712	311
5th year	Maintenance Cost - II Year	Earth work i.e., re-digging of pit Refilling of pits, (15%) Fencing (5% of plantation cost), Carriage of plants, Weeding, hoeing (twice), Application of insecticides, Application of FYM/ fertilizers(twice), Providing thorny protection to plants against Porcupine attack, Covering and uncovering of frost tender plant species (25%), Maintenance of inspection path, Watch and ward for every 10 ha of plantation, Spot Irrigation (8+1 times), Reopening of Trenches and pits, Insecticides including carriage, Fertilizers i.e., urea, etc. including carriage, Overhead charges (10% of maintenance of plantation cost) POL, OE and Miscellaneous.	47220	114

6th year	Maintenance Cost - III Year	Weeding hoeing (twice), Application of insecticides, Application of FYM/fertilizers (twice), Providing thorny protection to plants against Porcupine attack, Watch and ward for every 10 ha of plantation, Fertilizers i.e., urea, etc. including carriage, Overhead charges (10% of maintenance of plantation cost) POL, OE and Miscellaneous.	5863	10
Total Maintenance Cost (Rs.) =			**178795**	**435**
Total cost of Plantation (Rs.) =			**4,49,648**	**1107**

3.5.2 Agriculture Landscape

'Agriculture Landscapes' have been recognized as one of the zones within the Ravi Riverscape. Comprehensive afforestation/ plantations on private farm lands in agriculture landscape have been proposed in DPR. Farmers/ villagers do recognize significance of trees on farm/private lands and they come forward for availing saplings of economic and fruit trees for plantations not only to augment their income but they also do recognize ecological merits of such plantations. The current DPR, therefore, also proposes plantation activities in Agriculture Landscapes by adopting two models (RV/PB/AL/01, RV/PB/AL/02) in Punjab plains. It is widely assumed and accepted that farmers usually do not indulge in cutting of such economic and fruits tress except those are solely planted as agro-forestry plantations of fast growing species as they do recognize multiple values obtained from such tree plantations on farmlands. Moreover, incentives in the form of maintenance cost to be provided to the farmer at the rate of Rs. 70/-, Rs. 35/-, Rs. 35/- and Rs. 35/- per plant for first, second, third and fourth year, respectively will motivate them to protect and retain these planted tree species on their private land. The monetary aid proposed for the plantation will ensure sustainability of proposed plantations (maximum 150 trees/ ha) in Agriculture Landscapes and thus adding ecological benefits. Further, though the ownership of the plantation raised under the agriculture landscapes is vested with farmers but the felling, removal, and transportation of such plantation material are regulated under the framework of various acts and procedures, (e.g., State Felling and Transit Regulations, Land Preservation Act, etc.) and other relevant regulations enforced from time to time by the concerned States and UT.

The proposed Agricultural models will be implemented in private farmlands and community/Panchayat lands in rural areas. Availability of land will be ascertained by local officials of State Forest Department based upon proposals from local farmers and communities. Plants will be supplied to farmers and local communities who will carry out planting. Maintenance cost will be given to the land owners based upon plant survival at the end of first, second, third and fourth years. Nehru Yuva Kendra may play a pivotal role in facilitating coordination between State Forest Department and farmers/communities.

Treatment Models for Agriculture Landscape (AL) in Punjab

(i) Boundary Plantation Model

Model No. – RV/PB/AL/01	**Boundary Plantation Model**
Zone	**Agriculture/ Horticulture Land in Punjab**

The model will be applied in agriculture fields in the plains of Punjab. These fields are intensively cultivated for wheat, rice, sugarcane, etc. and prone to soil erosion especially during flood irrigation. Heavy monsoon rains in this zone transport huge quantities of silt to Ravi River causing siltation and floods in dams downstream. Intensive cultivation in this zone makes these areas vulnerable to soil erosion. Effective forestry interventions in these sites can help significantly in improvement of the flow of Ravi River and its tributaries.

The sites proposed for this model are agricultural lands where selected clones of Poplar (*Populus deltoides*), Dek (*Melia composita*), Neem (*Azadirachta indica*), Chandan (*Santalum album*), etc., will be planted at 4 m x 4 m spacing. Pit size of 50 cm x 50 cm x 40 cm will be used for plantation. Selected plants will be distributed to farmers for planting on their agricultural lands. Planting will be done by the farmers. The farmers will place requirement for plants to local forest officials who will supply the plants to the farmers at the start of the planting season.

List of species for plantation
Trees: *Populus deltoides*, *Melia composita*, *Eucalyptus* spp., *Phyllanthus emblica*, *Aegle marmelos*, *Albizzia* spp., *Azadirachta indica*, *Syzygium venosum* , *Gmelina arborea*, *Holarrhena antidysenterica*, *Santalum album*, *Tamarindus indica*, *Terminalia arjuna*, *Terminalia bellirica*, *Terminalia chebula*, etc.

Cost Sharing: The Government will share cost of planting material i.e., plant cost Rs. @ 70/- during the first year of establishment while Rs. 35/-, Rs. 35/-, Rs. 35/- during II to IV year and maximum of 150 trees per ha. So cost comes out to be Rs.10,500/ha. for I year and for II and to IV year will be Rs. 5,250/ha.

(ii) Block Plantation Model

Model No. -RV/PB/AL/02	**Block Plantation Model**
Zone	**Agriculture/ Horticulture land in Punjab**

This model will be applied in agriculture fields in the plains of Punjab region. These fields are intensively cultivated for wheat, rice, sugarcane, etc. and prone to soil erosion especially during flood irrigation.

Heavy monsoon rains in this zone transport huge quantities of silt to Ravi River causing siltation and floods in Dams downstream and floods in Punjab plains. Intensive cultivation in this zone makes these areas vulnerable to soil erosion. Effective forestry interventions in these sites can help significantly in improvement of the flow of Ravi River and its tributaries.

The sites proposed for this model are agricultural lands where selected tree species will be planted at 4 m x 4 m spacing – Pit size of 50 cm x 50 cm x 40 cm will be used for plantation. This is a practice of growing tree in rectangular or square planting pattern throughout the field as mostly adopted by farmers having large land holdings. Poplar (*Populus deltoides*), and Dek (*Melia composita*) are the important tree species for block planting. Wheat, potato, mustard, berseem, turmeric, sugarcane, etc. can be profitably raised intermixed with block plantation of trees. Planting will be done by the farmers. The farmers will place requisition for plants to local forest officials who will supply the quality nursery stock to the farmers at the start of the planting season.

List of species for plantation
Trees: *Populus deltoides*, *Melia composita*, *Phyllanthus emblica*, *Aegle marmelos*, *Albizia* spp., *Azadirachta indica*, *Syzygium venosum* , *Gmelina arborea*, *Holarrhena antidysenterica*, *Santalum album*, *Tamarindus indica*, *Terminalia arjuna*, *Terminalia bellirica*, *Terminalia chebula*, etc.

Table 3.25 - Cost Norms and Pattern of Assistance for High Density Block Plantation (HDBP)

Sr. No.	Magnitude of block Plantations (No. of Plants/Block of 1 ha)	Total Cost (Max.) (Rs.) for the Block (or in proportion to planting intensity)			
		1- Year	2- year	3- Year	4-Year
1	500 to 1000 (spacing 3.5mX3.5m)	28,000	14,000	14,000	14,000
2	>1000 to 1200 (spacing 3mX3m)	33,600	16,800	16,800	16,800
3	>1200 to 1500(spacing 2.5mX2.5m)	48,000	24,000	24,000	24,000
4	>1500(spacing less than 2.5mX2.5m))	52,000	26,000	26,000	26,000

Treatment Models for Urban Landscapes (UL) in Punjab

(i) Bio-remediation and Bio-filtration

Under the Urban Landscape models, Bio-remediation and bio-filtration is one of the important forestry intervention activity proposed for restoration of polluted stretches of rivers/tributaries.

Varied anthropogenic activities and ever burgeoning population have resulted in deterioration of river ecosystems making them unfit for survival of indigenous biological forms. Rampant industrialization, improper agricultural methods, unchecked discharge of pollutants both organic and inorganic into water bodies, drains, *nallahs*, hillsides, rivulets and streams ultimately leads to the contamination of the river systems. Heavy metal effluents from the processing units of industrial agglomerations situated in the towns are rebased in the river systems which degrade the quality of water, rendering of little or no use. Water bodies including rivers, lakes and streams have been heavily impacted due to the indiscriminate human activities and natural calamities and there is a great loss to their biodiversity or utility. In this dismal scenario, cleaning of water bodies and removal of toxic pollutants from the river ecosystems to restore freshwater bodies by making them free of contaminants is urgently required.

In comparison to the conventional methods like physical, chemical and thermal processes, bio-remediation techniques involving biological systems such as microorganisms or their products and plants are sustainable, cost effective options for abatement of pollution of the water bodies. In bio-remediation, biological systems are applied for reclamation of the contaminated water by transformation of toxic pollutants into less hazardous or completely non-hazardous forms. The bio-remediation technology includes use of microorganisms or their enzymatic machineries, phyto-remediation (plants) and rhizo-remediation (plant and microbe interactions) techniques. Thus, bio-remediation is an effective and eco-friendly technique for removing toxic pollutants from aquatic environment. Water pollution from untreated municipal wastewater is an enormous problem in urban agglomerations. Low-cost, decentralized, wetland-based bio-filters have strong potential to dramatically improve the water quality. Well-designed bio-treatment systems with inclusion of appropriate native plant species are ideal for removing pollutants from municipal wastewater. They can be applied extensively in rural areas, small towns, peri-urban areas of large cities, industrial townships or institutional campuses, as well as for certain types of industries such as agro-food/beverage etc. The biofilters are simple to construct, easy to operate, and cost effective. Major advantage of this method is that the pollutant is converted into biodegradable waste which can decompose within a moderate time frame, thus, producing no secondary pollutants. Broadly, in this technique plants and microbes associated with plant root system are used to remove the pollutants in the form of inorganic and organic wastes. A selection criterion of plants for achieving high efficiency is always important. For example plants such as *Tecoma stans*, *Scirpus grossus*, *Cyperus rotundus*, *Spirodela polyrrhiza* (aquatic plant), etc. have been found good for dye degradation.

Organic and inorganic substances released from various sources into the existing natural water bodies cause their contamination. Among various water pollutants, nitrogen compounds form a significant role in wastewater contamination due to increase in anthropogenic sources like Agriculture. Release of nitrate into freshwater poses severe problems including Eutrophication. Biological denitrification is one of the more versatile and promising methods for the treatment of nitrate contaminated waters.

The plants in bio-filters played a great role in removing phosphates, nitrates, nitrites and ammonia. Many substances harmful to people and animals are conducive to plant growth. Plants require ammonia, phosphates and nitrates, and most synthetic fertilizers. Duckweed (*Lemna* spp.), nut grass (*Cyperus rotundus*) and water lilies (*Nelumbo* spp.) are known to absorb these substances.

(i) Bio-remediation and Bio-filtration

Model No. - RV/PB/UL/01	**Bio-remediation and Bio-filtration**
Zone	**Proximate Areas to Polluted Stretches of Rivers/Tributaries**

The State Forest Department, Municipal Bodies have to adopt the suitable approach for Bio-filter suiting to the specific requirements and site characteristics. The model will include the following activities.

i. Waste water treatment through mechanical measures as per the site requirement.

ii. Drainage line treatment by planting grasses, herbaceous vegetation and shrubs.

iii. Bio-filters: Bio-filters may be of different types: Free floating macrophyte bio-filter, emergent macrophyte bio-filter, sub-merged macrophyte bio-filter, multispecies algal bio-filter.

List of species for plantation

Salix spp., *Eichhornia* spp., *Scirpus grossus*, *Spirodela polyrrhiza, Lemna* spp., *Cyperus rotundus* and *Nelumbo* spp., *Typha* spp., *Phragmites* spp., etc.

(ii) Riverfront Development

Model No. - RV/ PB/UL/02	**Riverfront Development**
Zone	**Along the River Course or Tributaries**

The proposed model of Riverfront development would involve plantation of avenue shrubs and trees along the riverbank to stabilize the soil and protect the bank from erosion. It would also have beds of annual flowering plants and patches of grasses. The area is so developed that would provide a pleasing and relaxing environment to the visitors. It would be a typical landscaping area comprised of vegetation and non-vegetation components.

According to requirements following components need to be created for riverfront development:

i. **Vegetation Part:** Grove consisting of shade trees, ornamental trees and bamboos, small herbal garden, climbers, hedges, grasses for lawn, etc.

ii. **Non-vegetation Part:** Stairs, pathways, walking trails, stone pitching, benches, rain shelters, e-public utilities, parking area, information centre, refreshment area, etc. as per the site specific requirements.

The vegetation and non-vegetation components will be arranged in such a way to enhance the aesthetic beauty of Riverfront. Ornamental species will be planted according to their recommended spacing and site specific suitability.

For using the available space economically and efficiently multi-tier planting methods will be used. Soil binding and water loving ornamental trees and shrubs are ideal choice for riverbank planting. To bind the surface soil, grasses and surface growers will be allowed to cover the surface and protect soil from erosion especially during rainy season or river flooding. It will minimise soil loss through sheet erosion, splash erosion and rill erosion. It will also improve rain water per collation or absorption. Besides this, small to medium sized herbs and shrubs will be accommodated at the second layer of vegetation to intercept some amount of sunlight and stop the fast/ forceful falling of rain drops directly from sky in turn which stop soil erosion (splash erosion). Small to medium sized ornamental trees or larger shrubs i.e., mainly light demanding plants will be accommodated at the third layer of canopy to cover the crown area. This layer will provide small timber, fuel, fodder and intangible benefits. The top canopy will be occupied by the strong light demanding species which are ultimately the dominant species on riversides.

List of species for plantation

Trees: *Jacaranda mimosifolia, Grevillea robusta, Albizia chinensis, Albizia procera, Butea monosperma, Kigelia pinnata, Dalbergia sissoo, Salix* spp., *Saraca asoca, Polyalthia longifolia, Callistemon citrinus, Syzygium venosum*, etc.

Shrubs: *Bougainvillea* spp., *Rosa* spp., *Nerium indicum, Nyctanthes arbor-tristis*, *Spiraea* spp., *Euonymus* spp., *Casuarina* spp., etc.

(ii) Institutional and Industrial Estate Plantations

Model No. – RV/PB/UL/03	**Institution and Industrial Estate Plantation**
Zone	**Institutions and Industrial Estate**

In this model mainly ornamental, shade and fruit plants will be encouraged for planting. Evergreen plants *Ficus rumphii*, *Syzygium venosum* and Silver oak (*Grevillea robusta*) will be preferred so that the leaves do not shed during winter months when air pollution is usually high in plains. Plantation of forest species will be raised near the vicinity of various institutions and industries at 3 m x 3 m. Pit size of 45 cm x 45 cm x 45 cm will be used for plantation. Pit size of 45 cm x 45 cm x 45 cm will be used for plantation. After land development, pit digging, etc. plants mainly of broadleaved species *Syzygium venosum, Anthocephalus cadamba, Dalbergia*

sissoo, Melia composita, Azadirachta indica, Pongamia pinnata, Holoptelea integrifolia, Acacia nilotica, etc. will be planted. The initiative will beautify the area, create awareness among people associated with institutions and industries and promote environmental services, besides providing economic returns from under-utilized land.

List of species for plantation
Trees: *Syzygium venosum, Anthocephalus cadamba, Dalbergia sissoo, Melia composita, Pongamia pinnata, Azadirachta indica, Thujaorientalis,Cryptomeria japonica, Araucaria araucana, Holoptelea integrifolia, Acacia nilotica, Jacaranda mimosifolia, Grevillea robusta, Albizzia chinensis, Albizzia procera, Salix babylonica, Saraca asoca, Polyalthia longifolia, Callistemon citrinus, Kigelia pinnata, Ficus* spp., etc.

(iv) Eco-Park Development

Model No. – RV/PB/UL/04	**Eco-Park Development**
Zone	**Proximity to Rivers and its Tributaries**

An Eco-Park will be better equipped than riverfront development to facilitate visitors. An Eco-Park will have both vegetation and non-vegetation components. Even in the Eco-Park the proportion of ornamental plants will be relatively more than in the riverfront development model.

According to the requirement, the lists of components to be created under this model are as follows.

i. **Vegetation Part:** Miscellaneous ornamental plant species i.e., trees, shrubs, herbs, creepers, hanging plants, etc.
ii. **Non-vegetation Part:** Fencing, stairs, pathways, walking trails, stone pitching, rain shelter, e-public utilities, benches, parking area, information centre, children playing area, pond beautification, landscaping, etc. as per site-specific requirements.

List of species for plantation

Tree: *Jacaranda mimosifolia, Grevillea robusta, Albizia chinensis, Albizia procera, Butea monosperma, Thujaorientalis, Cryptomeria japonica, Araucaria araucana, Kigelia pinnata, Dalbergia sissoo, Salix* spp., *Saraca assoca, Polyalthia longifolia, Callistemon viminalis, Syzygium venosum,* etc.

Shrubs: *Bougainvillea* spp., *Rosa* spp., *Nerium indicum, Nyctanthes arbor-tristis, Spiraea* spp., *Euonymus* spp., etc.

Table 3.26 – Cost Norms for Treatment Models for Urban Landscape in Punjab

Sr. No	Model No.	Amount Rs/Ha	Man days	Amount Rs/Ha	Man days	Amount Rs/Ha	Man days	Amount Rs/Ha	Man days
		Estt.		1st year Maint.		2nd year Maint.		3rd year Maint.	
1	RV/PB/UL/01 Bioremediation and Bio filtration	15,00,000	1316	4,50,000	395	3,00,000	263	2,25,000	197
2	RV/PB/UL/02 Riverfront Development	1,50,00,000	13,158	45,00,000	3,947	30,00,000	2,632	22,50,000	1,974
3	RV/PB/UL/03 Institution Plantation	2,60,000	228	78,000	68	52,000	46	39,000	34
4	RV/PB/UL /04 Eco-Park Development	1,50,00,000	13,158	45,00,000	3,947	30,00,000	2,632	22,50,000	1,974

3.5.4 Conservation Interventions

Three types of conservation interventions *viz*., (a) Soil and Water Conservation, (b) Riparian Wildlife Management, and (c) Wetland Management are being proposed for implementation by the Punjab State level IAs. Proposed conservation interventions will be implemented at the State and local field levels. Details of three type of conservation interventions proposed are presented below.

(B) Soil and Water Conservation Measures

The description on physical sub-environment provided earlier in the context of Ravi Riverscape has highlighted that the catchment of the river, particularly in the mountainous tract of Himachal Pradesh and Jammu & Kashmir UT suffers on account of landslides, bank erosion, habitat loss, construction activities and other unsustainable human activities resulting into severe problem of soil erosion and sedimentation. Accordingly, bioengineering as well as mechanical measures are envisaged for the purpose of soil and water conservation. Various models have been proposed for soil and water conservation in Punjab State which is given below in Table 3.27.

Table 3.27 - List of Models of Soil conservation Intervention

Sr. No.	Punjab
1.	RV / PB/CI/01- Brushwood Check Dam
2.	RV / PB /CI/02- Dry Stone Check Dam

3.	RV / PB /CI/03- Crate Wire Structure
4.	RV / PB /CI/04- Pond
5.	RV / PB /CI/05- Silt Detention Structure
6.	RV / PB /CI/06- Wetland Management
7.	RV / PB /CI/07- Riverine and Riparian Wildlife Management

Table 3.28 - Cost Norms of Treatment Models for Soil and Water Conservation Interventions in Punjab

Sr. No.	Model No.	Amount Rs/ m^3	Tentative Mandays
1	RV/PB/CI/01 Brushwood Interventions	300	1
2	RV/PB/CI /02 Dry stone activities	1800	5
3	RV/PB/CI /03 Crate wire activities	4500	13
4	RV/PB/CI/04 Water Ponds	350	2
5	RV/PB/CI /05 Silt Detention Dam Type Activities	6000	4

Table 3.29 - Details of Activities under Riverine and Riparian Management

Sr. No.	Components	Activities	Year				
			1	**2**	**3**	**4**	**5**
1	Protection	General Protection from illicit felling, illegal grazing, mining, poaching, etc.	√	√	√	√	√
		Survey and demarcation of boundaries and establishment and maintenance of permanent boundaries	√		√		√
		Physical Infrastructure (Watch Tower of Patrolling Path); Electric Vehicle; etc.	√	√	√		
		Field Equipment - Tranquillization Gun, Night Vision with Binoculars, GPS, Surveillance	√	√	√		

Sr. No.	Components	Activities	Year				
		equipment, Camera trap, etc.					
		Communications equipment including laptops, Wi-Fi system, etc.	√	√	√		
2	Habitat Management	Water ponds in every 2x2 km grid	√	√	√	√	
		Habitat enrichment plantations 1. Slopy area, 2. Riverine area (receded area broadcasting of lintels in strips, 3. Riparian area, and 4. Grass land development	√	√	√	√	√
		Soil and Water Conservations Measures	√	√	√	√	√
		Control of Invasive and Alien Species	√	√	√	√	√
3	Wild Faunal Species Management	Conservative Breeding; Re-introduction of Species, etc.	√	√	√	√	√
4	Research and Development	Short Term Projects up to 1 year; and Long Term Projects (5-Year)	√	√	√	√	√
		Essential Equipment and Field Infrastructure for facilitation of Research and Development and Monitoring					
5	Eco-development	Basic Infrastructure; Training to Tourist Guides of Peripheral Villages; Interpretation Centre for Nature Education	√	√	√	√	
6	Community Awareness and Participation	Creation of Self-help Groups (SHG), Provision of Revolving Fund for SHG; Alternate Income Generation Activities; Federation for Developing Entrepreneurship and Supply Management, etc.	√	√	√	√	√
7	Eco-tourism	Provision of Essential Facilities; Regulation of Tourism Activities, with respect to carrying capacity of the area etc.	√	√	√	√	

Table 3.30 - Component-wise Details of Activities under Wetland Management (Natural and Artificial)

Sr. No.	Components	Activities	Year				
			1	2	3	4	5
1	Protection	General Protection from illicit felling, illegal grazing, mining, poaching, etc.	√	√	√	√	√
		Survey and demarcation of boundaries and establishment and maintenance of permanent boundaries	√		√		√
		Physical Infrastructure i.e., Watch Tower, Patrolling Path; Electric Vehicle; Field Equipment - Tranquillization Gun, Night Vision with Binoculars, GPS, etc.	√	√	√		
		Communications	√	√	√		
2	Habitat Management	Habitat enrichment plantations 1. Sloppy area, 2. Riverine area (receded area broadcasting of lintels in strips, 3. Riparian area, and 4. Grass land development	√	√	√	√	√
		Soil and Water Conservation Measures	√	√	√	√	√
		Control of Invasive and Alien Species	√	√	√	√	√
		Creations of Mounds/ Highlands	√	√	√	√	√
3	Wild Faunal Species Management	Conservative Breeding; Re-introduction of Species, etc.	√	√	√	√	√
4	Research and Development	Short Term Projects up to 1 year; Long Term Projects (5-Year)	√	√	√	√	√
		Essential Equipment and Field Infrastructure for facilitation of Research and Development and Monitoring					

Sr. No.	Components	Activities	Year				
5	Eco-development	Basic Infrastructure; Training to Tourist Guides of Peripheral Villages; and Interpretation Centre for Nature Education	√	√	√	√	
6	Community Awareness and Participation	Creation of Self-help Groups (SHG), Provision of Revolving Fund for SHG; Alternate Income Generation Activities; Federation for Developing Entrepreneurship, Supply Management, etc.	√	√	√	√	√
7	Ecotourism	Provision of Essential Facilities; Regulation of Tourism Activities, etc.	√	√	√	√	

Table 3.31 – Cost Norms of Treatment Models for other Conservation Interventions in Punjab

Sr. No	Year	RV/PB/CI/06 Riverine and Riparian Management		RV/PB/CI/07 Wetland Management	
		Amount Rs/ha	Tentative Mandays	Amount Rs/ha	Tentative Mandays
	1st year	3,20,000	374	2,80,000	327
	2nd year	2,80,000	306	2,50,000	273
	3rd year	1,90,000	194	1,60,000	163
	4th year	1,20,000	115	1,20,000	115
	5th year	90,000	80	90,000	80

3.5.5 Supporting Activities

In addition to the above stated proposed forestry interventions in three types of landscapes (Natural, Agriculture, and Urban) and three types of conservation interventions, execution of priority supporting activities is considered vital for the successful implementation of the present DPR and envisaged wide range of specific activities in the priority sites identified

within the riverscape on the basis of geospatial analysis and inputs from the field. A list of supporting activities in given below (Table 3.32).

Table 3.32 - List of Supporting Activities for Ravi Riverscape in Punjab

Sr. No.	Punjab
1.	RV/PB/SA/01- Policy Level Intervention
2.	RV/PB/SA/02- Strategic Adaptive Research and Development
3.	RV/PB/SA/03- Participatory Monitoring
4.	RV/PB/SA/04- Capacity Development
5.	RV/PB/SA/05- Awareness
6.	RV/PB/SA/06- Evaluation
7.	RV/PB/SA/07- Project Management

3.5.6 Project Budget

Implementation of Forestry Interventions in Punjab accounts for Rs.88.14 Crores for all the components, Rs. 78.25 Crores for the three landscapes and SMC measures in establishment phase only and Rs. 79.37 Crores for Establishment and maintenance phase excluding establishment and maintence cost of supporting activities. Year-Wise Breakup of Extent and Cost Coverage of Proposed Forestry Interventions in Punjab are described in tables 3.35-3.52 and Division Wise modelwise/sitwise projected extent and cost tables of Punjab are enclosed as annexures 19 (a) to 23(b). The consent letters regarding availability of land in different landscapes in Punjab has been enclosed as Annexure 43 in Vol. II.

Table 3.33 – Component/ Activity Wise Budget Allocation for Punjab

Sr. No.	Component/ Activity	Amount (Rs. in Crore)
	Implementation of Forestry Interventions in Punjab (A1+A2+C1+C3)	**79.37**
A.1	**Plantations and Treatment Models in Three Categories of Landscape**	**47.65**
A.1.1	Natural Landscapes	20.92
A.1.2	Agriculture Landscapes	3.11
A.1.3	Urban Landscapes	23.62
A.2	**Conservation Interventions**	**23.88**
A.2.1	Soil and Moisture Conservation	14.10
A.2.2	Riverine and Riparian Wildlife Management	5.19
A.2.3	Wetland Management (Natural and Artificial	4.59
A.3	**Supporting Activities**	**6.72**

A.3.1	Policy Level Interventions	0.06
A.3.2	Research Activities	0.75
A.3.3	Capacity Development	1.96
A.3.4	Awareness	0.66
A.3.5	Participatory Monitoring	0.28
A.3.6	Cost of PMUs of Two State Level Implementing Agencies	2.83
A.3.7	Evaluation	0.17
A.3.8	Contingency and Miscellaneous Activities	0.01
A.	**Implementation of Forestry Interventions in Punjab (A1+A2+A3)**	**78.25**
B.	**Strengthening Knowledge Management and National Capacity for Forestry Interventions and Conservation of Riverscapes**	**0.00**
C.	**DPR – Phase II (Maintenance phase) Including Scaling Up and Replication of Successful Models of Forestry Interventions**	**9.89**
C.1	Maintenance Cost of A.1 and A.2 (Cost of Phase II)	4.26
C.2	Maintenance Cost of A.3	2.05
C.3	Scaling Up and Replication of Successful Models of Forestry Interventions (5% of A.1 & A.2)	3.58
D.	**National Coordination for Forestry Interventions and Riverscape Conservation**	**0.00**
Total Phase I (A+B+D)		**78.25**
Total Project Cost (Phase I+II) (A+B+C+D)		**88.14**

Table 3.34 – Year-Wise Breakup of Extent Coverage of Proposed Forestry Interventions in Punjab

Year	Period	Plantation and Treatment Models			Conservation Intervention		
		Natural Landscape (ha)*	Agriculture Landscape (ha)	Urban Landscape (ha)	Soil and Moisture Conservation Measures (m^3)	Riverine and Riparian Wildlife Management (ha)**	Wetland Conservation (ha)**
D. Phase I (Implementation Phase)							
I	**Est.**	-	339	36.2	16250	-	6
II	**Est.**	-	292	38.8	56580	57	50
	Maint.	-	339	36.2	-	-	6
III	**Est.**	364	187	29.4	53300	-	0
	Maint.	-	631	75	-	57	56
IV	**Est.**	311	-	-	44820	-	-
	Maint.	364	818	104.4	-	57	56
V	**Est.**	120	-	-	14550	-	-
	Maint.	675.354	479	68.2	-	57	56
Total	**Est.**	795.35	818	104.4	185500	57	56

Year	Period	Plantation and Treatment Models			Conservation Intervention		
		Natural Landscape (ha)*	Agriculture Landscape (ha)	Urban Landscape (ha)	Soil and Moisture Conservation Measures (m^3)	Riverine and Riparian Wildlife Management (ha)**	Wetland Conservation (ha)**
Phase I	**Maint.**	675.35	818	104.4	-	57	56
B. Phase II (Maintenance Phase)							
VI	**Est.**	-	-	-	-	-	-
	Maint.	795.354	187	29.4	-	57	50
VII	**Est.**	-	-	-	-	-	-
	Maint.	431.354	-	-	-	-	-
VIII	**Est.**	-	-	-	-	-	-
	Maint.	120	-	-	-	-	-
IX	**Est.**	-	-	-	-	-	-
	Maint.	-	-	-	-	-	-
X	**Est.**	-	-	-	-	-	-
	Maint.	-	-	-	-	-	-
Total Phase II	**Est.**	-	-	-	-	-	-
	Maint.	795.354	187	29.4	-	57	50
Grand Total Phase I and Phase II	**Est.**	795.35	818	104.4	185500	57	56
	Maint.	795.35	818	104.4	-	57	56

**Natural Landscape also include fire protection and Natural regeneration **Area is virtual, considered for calculation of budgetary provisions*

**Est.=Establishment; and Maint.=Maintenanc*

Table 3.35 - Year-Wise Breakup of Cost for Proposed Forestry Interventions in Punjab

Year	Period	Plantation and Treatment Models			Conservation Intervention		
		Natural Landscape (Rs. in Lakhs)	Agriculture Landscape (Rs. in Lakhs)	Urban Landscape (Rs. in Lakhs)	Soil and Moisture Conservation Measures (Rs. in Lakhs)	Riverine and Riparian Wildlife Management (Rs. in Lakhs)	Wetland Conservation (Rs. in Lakhs)
D. Phase I (Implementation Phase)							
I	**Est.**	65.26	41.82	136.00	142.35	0	17.00
II	**Est.**	194.60	46.56	1005.40	540.04	182.40	140.00
	Maint.	-	22.38	40.80	-	0	15.00
III	**Est.**	576.03	31.26	318.90	309.95	0	0
	Maint.	-	49.98	328.82	-	159.60	134.60
IV	**Est.**	516.63	-	-	153.28	0	0
	Maint.	209.84	71.06	317.15	-	108.30	87.20
V	**Est.**	132.51	-	-	264.60	0	0
	Maint.	397.24	47.89	214.59	-	68.40	65.40
Total Phase I	**Est.**	1485.03	119.64	1460.30	1410.22	182.40	156.80
	Maint.	607.08	191.31	901.36	-	336.30	302.20
B. Phase II (Maintenance Phase)							
VI	**Est.**	-	-	-	-	-	-

Year	Period	Plantation and Treatment Models			Conservation Intervention		
		Natural Landscape (Rs. in Lakhs)	Agriculture Landscape (Rs. in Lakhs)	Urban Landscape (Rs. in Lakhs)	Soil and Moisture Conservation Measures (Rs. in Lakhs)	Riverine and Riparian Wildlife Management (Rs. in Lakhs)	Wetland Conservation (Rs. in Lakhs)
	Maint.	207.54	19.73	47.85	-	51.30	45.00
VII	**Est.**	-	-	-	-	-	-
	Maint.	45.51	-	-	-	-	-
VIII	**Est.**	-	-	-	-	-	-
	Maint.	8.87	-	-	-	-	-
IX	**Est.**	-	-	-	-	-	-
	Maint.	-	-	-	-	-	-
X	**Est.**	-	-	-	-	-	-
	Maint.	-	-	-	-	-	-
Total Phase II	**Est.**	-	-	-	-	-	-
	Maint.	261.92	19.73	47.85	-	51.30	45.00
Grand Total Phase I and Phase II	**Est.**	1485.03	119.64	1460.30	1410.22	182.40	156.80
	Maint.	869.00	211.04	949.21	-	387.60	347.20

Table 3.36 – Division Wise Proposed Extent of Plantations in Natural Landscapes in Punjab

Sr No	Division	Year									Year				Grand Total	
		Phase I							Phase I		Phase II					
		(Extent in ha)							Total(Extent in ha)		(Extent in ha)			Total (ha)	(Ha)	(Ha)
		I	II	III	IV		V				VI	VII	VIII			
		Estb.	Estb.	Estb.	Estb.	Maint.	Estb.	Maint.	Estb.	Maint.	Maint.	Maint.	Maint.	Maint.	Estb.	Maint.
1	Amritsar	69	0	69	0	69	0	69	69	69	69	0	0	69	69	69
2	Gurdaspur	275	291.35	275	291.35	275	0	566.35	566.35	566	566.35	291.35	0	566.35	566.35	566.35
3	Pathankot	20	20	20	20	20	120	40	160	40	160	140	120	160	160	160
Total		**364**	**311**	**364**	**311**	**364**	**120**	**675.354**	**795.35**	**675.35**	**795.354**	**431.354**	**120**	**795.35**	**795.35**	**795.35**

*Note: **Area of Natural Landscapes is virtual, considered for budgetary provisions *Est.=Establishment and Maint.=Maintenanc*

Table 3.37 – Division Wise Projected Cost of Plantations in Natural Landscapes in Punjab

Sr.No	Division	Year							Year				Grand Total		
		Phase I						Phase I	Phase II						
		(Rs.in Lakhs)						(Rs. in Lakhs)	(Rs. in Lakhs)						
		I	II	III	IV		V	Total	VI	VII	VIII	Total	Rs. In lakhs		
		Establishment (Nursery raising for 3rd year creation)	Establishment(Advance work for 3rd year plantation and Nursery raising for 4th year Creation	Establishment (i/c creation cost for 3rd year, Advance cost of 4th	Establishment (i/c creation cost for 4th year, Advance cost of 5th year and nursery cost of 5th year plantation)	Maintenance (Maint cost of plantation 3rd year maint, maint cost of nursery	Establishment (i/c creation cost for 5th year	Maintenance (Maint. Cost of plantation 3rd year and 4th year maint, maint cost of nursery	Establishment	Maint	Maint	Maint	Maint	Maint	Establishment	Maintenance	Total Cost
1	Amritsar	17.72	25.5	97.18	0	57.81	0	22.49	140.39	80.3	4.64	0	0	4.64	140.39	84.94	225.34
2	Gurdaspur	44.32	160.86	432.41	464.43	141.72	0	360.17	1102.01	501.89	135.31	18.42	0	153.73	1102.01	655.62	1757.63
3	Pathankot	3.22	8.24	46.44	52.2	10.31	132.51	14.58	242.62	24.88	67.59	27.09	8.87	103.56	242.62	128.44	371.06
Total		65.26	194.6	576.03	516.63	209.84	132.51	397.24	1485.03	607.08	207.54	45.51	8.87	261.93	1485.03	869.01	2354.03

Table 3.38 – Division Wise Proposed Extent of Plantations in Agriculture Landscapes in Punjab

Sr. No	Division	Phase I: Year Wise Area (ha)							Phase I Total Area (ha)		Phase II: Area (ha)	Total Area Phase II (ha)	Grand Total Area (ha)	
		I	II		III		IV	V			VI			
		*Estb	Estb	**Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint
1	Amritsar	185	60	185	12	245	257	72	257	257	12	12	257	257
2	Gurdaspur	80	119	80	80	199	279	199	279	279	80	80	279	279
3	Pathankot	74	113	74	95	187	282	208	282	282	95	95	282	282
Total		**339**	**292**	**339**	**187**	**631**	**818**	**479**	**818**	**818**	**187**	**187**	**818**	**818**

Table 3.39 – Division Wise Projected Cost of Plantations in Agriculture Landscapes in Punjab

Sr. No	Division	Phase I: Year Wise Cost (Rs in Lakhs)							Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
		I	II		III		IV	V			VI Year				
		Estb	Estb	Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Amritsar	22.50	9.30	12.04	5.76	18.47	23.03	9.19	37.56	62.73	3.53	3.53	37.56	66.26	103.82
2	Gurdaspur	7.20	22.02	3.85	11.10	16.19	23.59	20.45	40.32	64.08	7.07	7.07	40.32	71.15	111.47
3	Pathankot	12.12	15.24	6.49	14.40	15.32	24.44	18.25	41.76	64.5	9.13	9.13	41.76	73.63	115.39
Total		**41.82**	**46.56**	**22.38**	**31.26**	**49.98**	**71.06**	**47.89**	**119.64**	**191.31**	**19.73**	**19.73**	**119.64**	**211.04**	**330.68**

Table 3.40 – Division Wise Proposed Extent of Interventions in Urban Landscapes in Punjab

Sr. No	Division	YEAR											Grand Total Area (ha)	
		Phase I (Extent of Area in ha)							Phase I		Phase II			
		I	II		III		IV	V	Total		VI	Total		
		*Estb	Estb	**Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Total	Estb.	Maint
1	Amritsar	11	11.3	11	9.1	22.3	31.4	20.4	31.4	31.4	9.1	9.1	31.4	31.4
2	Gurdaspur	12.2	13.1	12.2	9.3	25.3	34.6	22.4	34.6	34.6	9.3	9.3	34.6	34.6

3	**Pathankot**	13	14.4	13	11	27.4	38.4	25.4	38.4	38.4	11	11	38.4	38.4
Total		**36.2**	**38.8**	**36.2**	**29.4**	**75**	**104.4**	**68.2**	**104.4**	**104.4**	**29.4**	**29.4**	**104.4**	**104.4**

**Est.=Establishment; and **Maint.=Maintenance.*

Table 3.41 – Division Wise Projected Cost of Interventions in Urban Landscapes in Punjab

Sr. No	Division	Phase I: Year Wise Cost (Rs in Lakhs)							Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
		I	II		III		IV	V			VI Year				
		*Estb	Estb	**Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	**Amritsar**	41	380.8	12.3	184.7	122.44	137.72	94.06	606.5	366.52	27.71	27.71	606.5	394.23	1000.73
2	**Gurdaspur**	61.2	221	18.36	80.8	78.54	77.62	49.31	363	223.83	12.13	12.13	363	235.96	598.96
3	**Pathankot**	33.8	403.6	10.14	53.4	127.84	101.81	71.22	490.8	311.01	8.01	8.01	490.8	319.02	809.82
Total		**136**	**1005.4**	**40.8**	**318.9**	**328.82**	**317.15**	**214.59**	**1460.3**	**901.36**	**47.85**	**47.85**	**1460.3**	**949.21**	**2409.51**

**Est.=Establishment; and **Maint.=Maintenance.*

Table 3.42 – Division Wise Proposed Extent for Soil and Moisture Conservation (Area in m^3) for Punjab

Sr. No	Division	YEAR						Grand Total Area (ha)
		Phase I (Extent of Area in ha)					Phase I	
		I	II	III	IV	V	Total	
		*Estb	Estb	Estb	Estb	Estb	Estb	Estb.
1	Amritsar	4560	21810	18320	15070	5250	65010	65010
2	Gurdaspur	11390	34270	34050	29700	9200	118610	118610
3	Pathankot	300	500	930	50	100	1880	1880
Total		16250	56580	53300	44820	14550	185500	185500

**Est.=Establishment*

Table 3.43 – Division Wise Projected Cost for Soil and Moisture Conservation (Rs. in Lakhs) in Punjab

Sr. No	Division	Phase I: Year Wise Cost (Rs in Lakhs)					Total Phase I (Rs.in Lakhs)	Grand Total (Rs.in Lakhs)
		I	II	III	IV	V		
		*Estb	Estb	Estb	Estb	Estb	Estb	
1	Amritsar	13.68	177.84	111.16	51.48	97.2	451.36	451.36
2	Gurdaspur	124.77	345.1	193.36	101.65	165.6	930.48	930.48
3	Pathankot	3.9	17.1	5.43	0.15	1.8	28.38	28.38
Total		142.35	540.04	309.95	153.28	264.6	1410.22	1410.22

**Est.=Establishment*

Table 3.44 – Division Wise Proposed Extent (in ha) for Riverine and Riparian Wetland Management and Wildlife Conservation in Punjab

Sr. No	Division	Phase I: Year Wise Extent of Area (ha)**						Phase I Total		Phase II Year Wise Extent of Area (ha)**		Grand Total (ha)	
		I	II		III	IV	V			VI	Total		
		*Estb	Estb	**Maint	Maint	Maint	Maint	Estb	Maint	Maint	Total	Estb	Maint
1	Amritsar	6	0	6.00	6	6	6	6	6	0	0	6	6
2	Pathankot WL	0	20	0.00	20	20	20	20	20	20	20	20	20
3	Pathankot WL	0	87	0.00	87	87	87	87	87	87	87	87	87
Total		**6**	**107**	**6**	**113**	**113**	**113**	**113**	**113**	**107**	**107**	**113**	**113**

Note: ***Area of Riverine & Riparian Wildlife Management and Wetland Management is virtual, considered for budgetary provisions*

**Est.=Establishment; and **Maint.=Maintenance.*

Table 3.45 – Division Wise Projected Cost (Rs. in Lakhs) for Riverine and Riparian Wetland Management and Wildlife Conservation in Punjab

Sr. No	Division	Phase I: Year Wise Cost (Rs in Lakhs)						Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
		I	II		III	IV	V			VI Year				
		*Estb	Estb	**Maint	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Amritsar	16.8	0	15	9.6	7.2	5.4	16.8	37.2	0	0	16.8	37.2	54
2	Pathankot WL	0	64	0	56	38	24	64	118	18	18	64	136	200
3	Pathankot WL	0	258.4	0	228.6	150.3	104.4	258.4	483.3	78.3	78.3	258.4	561.6	820
Total		**16.8**	**322.4**	**15**	**294.2**	**195.5**	**133.8**	**339.2**	**638.5**	**96.3**	**96.3**	**339.2**	**734.8**	**1074**

**Est.=Establishment; and **Maint.=Maintenance.*

Table 3.46 – Year-Wise Projected Cost for Supporting Activities

Sr.No.	Activities	Year											
		(Cost Rs. in lakh)										Total	Grand Total (Cost Rs. in lakh)
		Phase I					Total	Phase II				Phase II	Phase I+II
		I	II	III	IV	V	Phase I	VI	VII	VIII	IX	X		
1	Policy Level Interventions	1.36	1.00	1.05	1.10	1.15	**5.65**	0.36	0.00	0.00	0.00	0.00	0.36	**6.01**
2	Research	13.58	14.26	14.98	15.72	16.51	**75.05**	8.67	9.10	9.56	10.03	10.54	47.89	**122.95**
3	Capacity Development	36.00	37.80	44.69	41.67	35.90	**196.06**	0.00	0.00	0.00	0.00	0.00	0.00	**196.06**
4	Awareness	12.00	12.60	13.23	13.89	14.59	**66.31**	0.00	0.00	0.00	0.00	0.00	0.00	**66.31**
5	Participatory Monitoring	6.79	6.11	5.50	4.95	4.46	**27.81**	4.01	3.61	3.25	2.92	2.63	16.42	**44.23**
6	Project Management Unit	67.91	49.86	52.30	54.87	57.56	**282.51**	17.85	15.97	14.92	13.95	13.04	75.73	**358.24**
7	Evaluation	0.00	0.00	17.01	0.00	0.00	**17.01**	28.25	0.00	0.00	0.00	35.82	64.08	**81.08**
8	Contingency and Miscellaneous Expenses	0.34	0.25	0.26	0.27	0.29	**1.41**	0.09	0.08	0.07	0.07	0.07	0.38	**1.79**
Grand Total		**137.99**	**121.88**	**149.02**	**132.48**	**130.45**	**671.82**	**59.22**	**28.76**	**27.80**	**26.98**	**62.10**	**204.86**	**876.68**

Table 3.47 – Year-Wise Projected Cost of State Project Management Unit

Sr.No.	Activities	Year												Grand Total
		(Cost Rs.in Lakh)												
		Phase I					Total	Phase II					Total	(Cost Rs. in lakh)
		I	II	III	IV	V	Phase I	VI	VII	VIII	IX	X	Phase II	
1	Project Staff - Salary and Wages (PED/PEO/SPA+PA+OA+A+DEO for each Division-3) and 50% staff in Phase II	41.16	43.218	45.38	47.65	50.03	**227.43**	15.76	14.89	14.07	13.30	12.57	**70.59**	**298.03**
2	Office Expenses (including executing Divisions)	4.12	0.43	0.45	0.48	0.50	**5.98**	0.16	0.15	0.14	0.13	0.13	**0.71**	**6.68**
3	POL (including executing Divisions)	4.12	0.43	0.45	0.48	0.50	**5.98**	0.16	0.13	0.10	0.07	0.04	**0.49**	**6.47**
4	Travel Expenses (including executing Divisions)	4.12	4.32	4.54	4.76	5.00	**22.74**	1.58	0.60	0.42	0.27	0.13	**2.99**	**25.73**
5	Equipment – Office and Field	2.06	0.02	0.02	0.02	0.02	**2.15**	0.02	0.02	0.02	0.02	0.02	**0.12**	**2.27**
6	Purchase of Equipment -Computer, RS and GIS and IT and maintenance	4.12	0.96	0.96	0.96	0.96	**7.94**	0.05	0.05	0.05	0.05	0.05	**0.24**	**8.18**
7	Furniture and Fixtures	4.12	0.05	0.05	0.05	0.05	**4.31**	0.05	0.05	0.05	0.05	0.05	**0.24**	**4.55**
8	Contingency and Miscellaneous	4.12	0.43	0.45	0.48	0.50	**5.98**	0.08	0.07	0.07	0.07	0.06	**0.35**	**6.33**
	Grand Total	67.91	49.86	52.30	54.87	57.56	**282.51**	17.85	15.97	14.92	13.95	13.04	**75.73**	**358.24**

Table 3.48 – Projected Cost of Awareness Programme

Sr.No.	Activity	Phase I					Grand Total
		Year					(Cost Rs. in lakh)
		(Cost Rs. in lakh)					
		I	II	III	IV	V	
1	Awareness Campaigns@1	1.5	1.58	1.65	1.74	1.82	**8.29**
2	Awareness Activities for General Public@2	3	3.15	3.31	3.47	3.65	**16.58**
3	Awareness Material – Pamphlets, Brochures, Booklets, Signages, Boards and Hoardings @2	3	3.15	3.31	3.47	3.65	**16.58**
4	Publicity Through Mass Media@3	4.5	4.73	4.96	5.21	5.47	**24.87**
Grand Total		**12.00**	**12.60**	**13.23**	**13.89**	**14.59**	**66.31**

Table 3.49 – Projected Cost of Capacity Development at State and Division Level

Sr.No.	Activity	Norms Rs. in lakh	Phase I					Grand Total
			Year					(Cost Rs. in lakh)
			(Cost Rs. in lakh)					
			I	II	III	IV	V	
1	Local Level Training for Communities (Trainings; 2-3 days) 25	2	3	3.15	3.31	3.47	0.00	12.93
2	Division Level Trainings for SFD Personnel, Line Departments and Other Partner Agencies (1 Training/ Division/ 2-3 days) 25	2	3	3.15	3.31	3.47	0.00	12.93
3	State Level Inception Workshop (2-3 days) 1	5	5	5.25	5.51	5.79	0.00	21.55
4	State Level Seminar – Mid Term (2-3 days) 1 and Final year (1)	5	0	0.00	5.00		5.51	10.51
5	Exposure Trip Within State (30 participants; 2 per year)	5	10	10.50	11.03	11.58	12.16	55.26
6	Exposure Trip Outside State (15 participants; 1 per year)	10	15	15.75	16.54	17.36	18.23	82.88
Grand Total			**36.00**	**37.80**	**44.69**	**41.67**	**35.90**	**196.06**

Table 3.50(a) - Division Wise Details of Area/Extent and Cost for Three Different Landscapes in Punjab (Part-I)

Sr. No.	Division	Natural Landscape*				Agriculture Landscape				Urban Landscape			
		Total Area (ha)*	Cost (Rs. in Lakhs)		Total Cost (Rs. in Lakhs)	Total Area (ha)	Cost (Rs. in Lakhs)		Total Cost (Rs. in Lakhs)	Total Area (ha)	Cost (Rs. in Lakhs)		Total Cost (Rs. in Lakhs)
			*Estb.	**Maint.			*Estb.	**Maint.			*Estb.	**Maint.	
1	Amritsar	69	140.39	84.94	225.34	257	37.56	66.26	103.82	31.4	606.5	394.23	1000.73
2	Gurdaspur	566.35	1102.01	655.62	1757.63	279	40.32	71.15	111.47	34.6	363	235.96	598.96
3	Pathankot	160	242.62	128.44	371.06	282	41.76	73.63	115.39	38.4	490.8	319.02	809.82
Total		**795.35**	**1485.03**	**869.01**	**2354.03**	**818**	**119.64**	**211.04**	**330.68**	**104.4**	**1460.3**	**949.21**	**2409.51**

**In Natural Landscape total area and total cost also include cost and area of fire protection and Natural Regeneration Models*

**Est.=Establishment; and **Maint.=Maintenance.*

Table 3.50(b) - Division Wise Details of Area/Extent and Cost for Three Different Landscapes and SMC Activities in Punjab (Part-II)

Sr. No.	Division	Grand Total Area of Three Landscapes (ha)	Total Cost of Three Landscapes (Rs. in Lakhs)	SMC Measures		Grand Total Cost of Three Landscapes and SMC (Rs. in Lakhs)
				Total Extent (m^3)	Total Cost (Rs. in Lakhs)	
1	**Amritsar**	357.4	1329.89	65010	451.36	1781.25
2	**Gurdaspur**	879.95	2468.06	118610	930.48	3398.54
3	**Pathankot**	480.4	1296.27	1880	28.38	1324.65
Total		**1717.75**	**5094.22**	**185500**	**1410.22**	**6504.44**

Table 3.51 - Division Wise Details of Area and Cost for Riverine & Riparian Wildlife Management and Wetland Management in Punjab

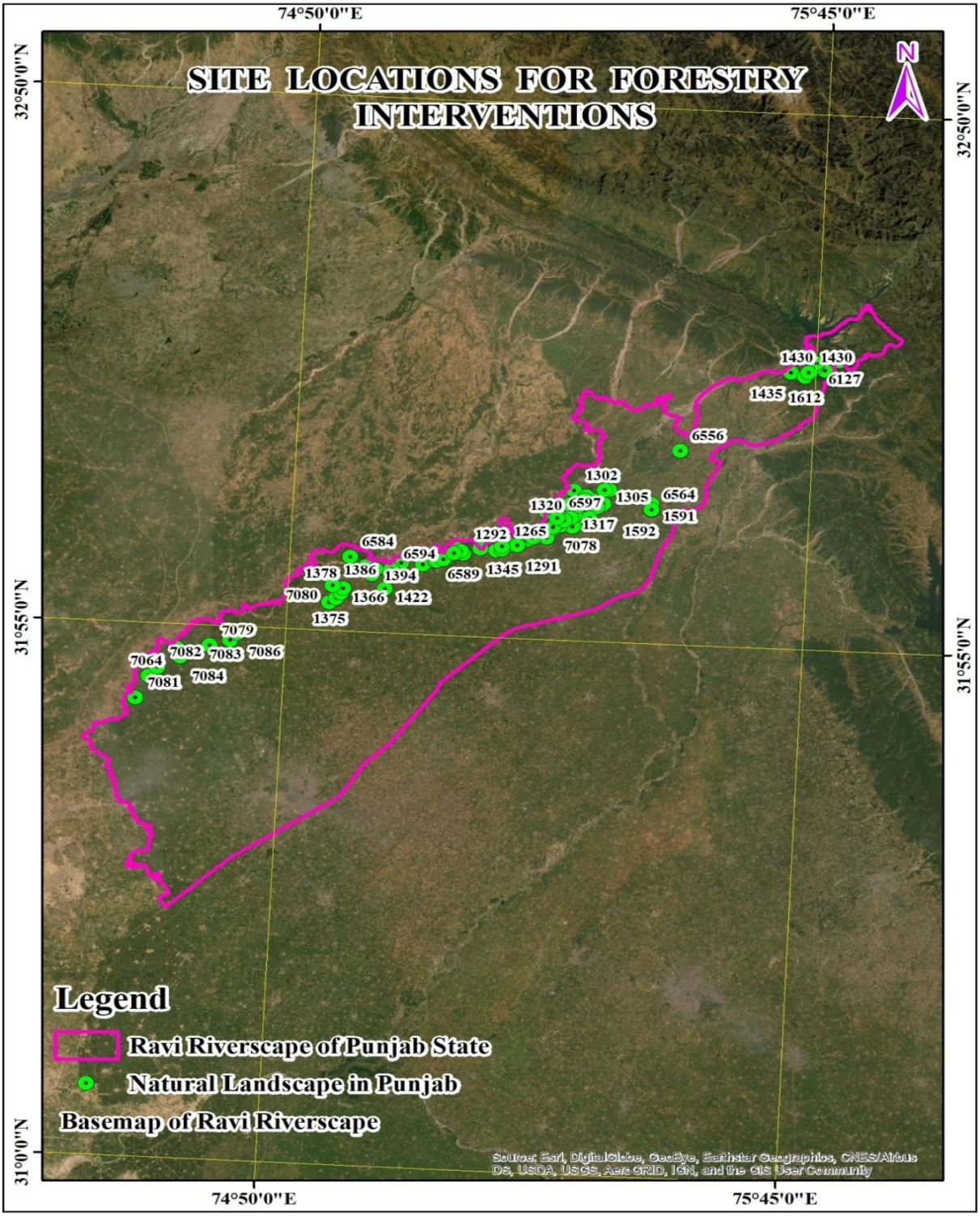
Sr. No.	Divisions	Total Area (ha)*	Cost (Rs. in Lakhs		Grand Total Cost (Rs. in Lakhs
			*Estb.	**Maint.	
1	**Amritsar**	6	16.8	37.2	54
2	**Pathankot WL**	20	64	136	200
3	**Pathankot WL**	87	258.4	561.6	820
Total		**113**	**339.2**	**734.8**	**1074**

Note: ***Area of Riverine & Riparian Wildlife Management and Wetland Management is virtual, considered for budgetary provisions*

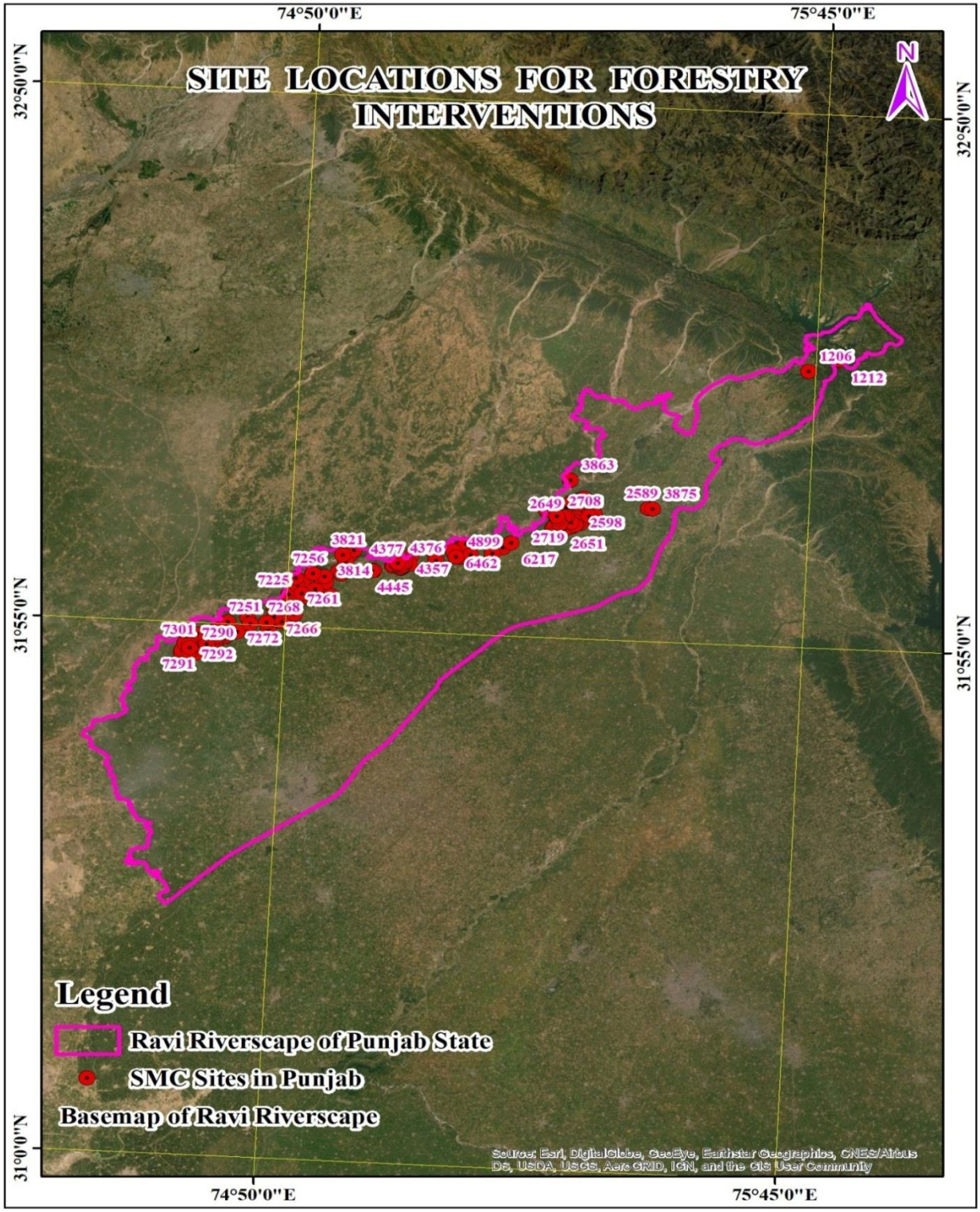
**Est.=Establishment; and **Maint.=Maintenance.*

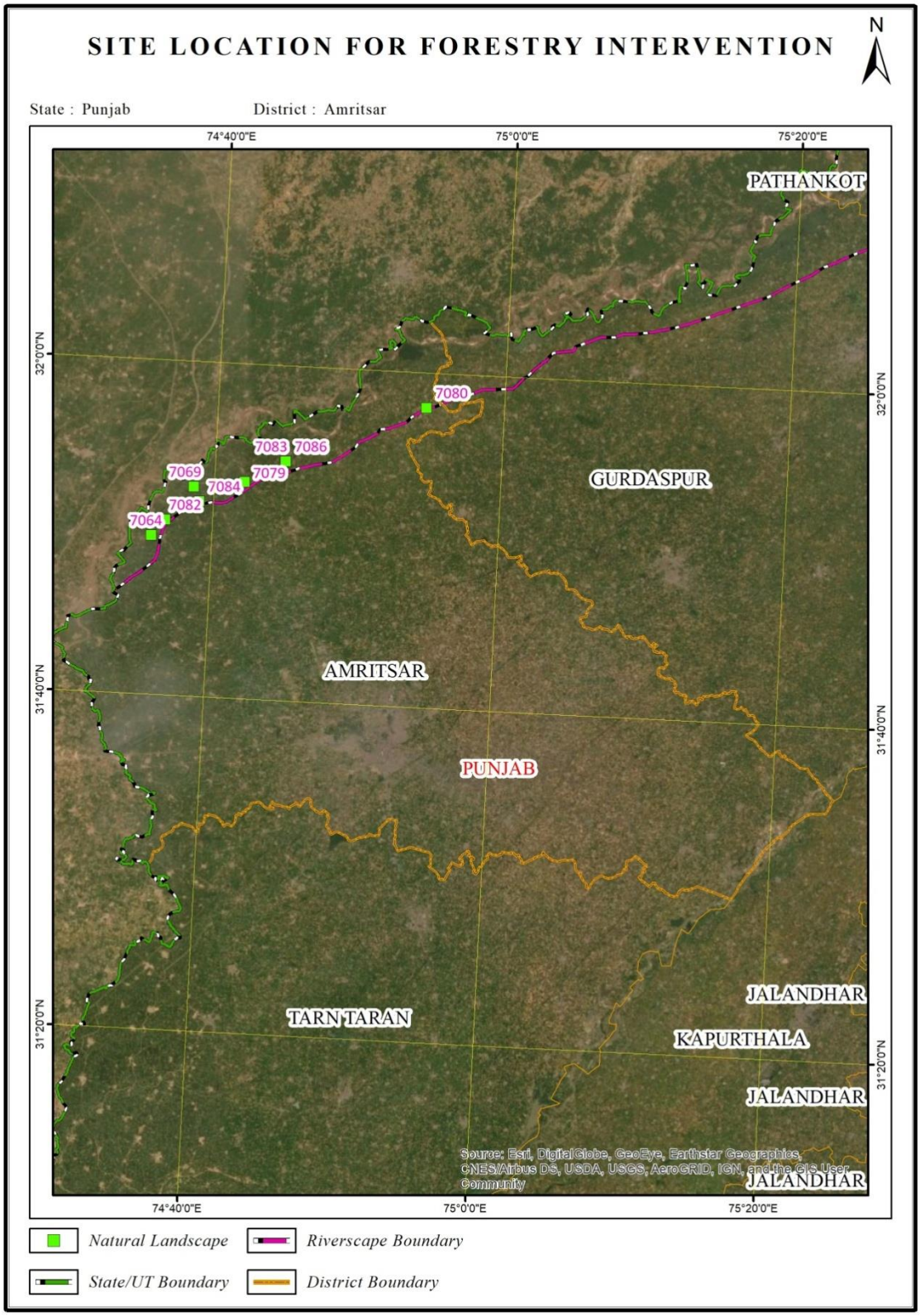
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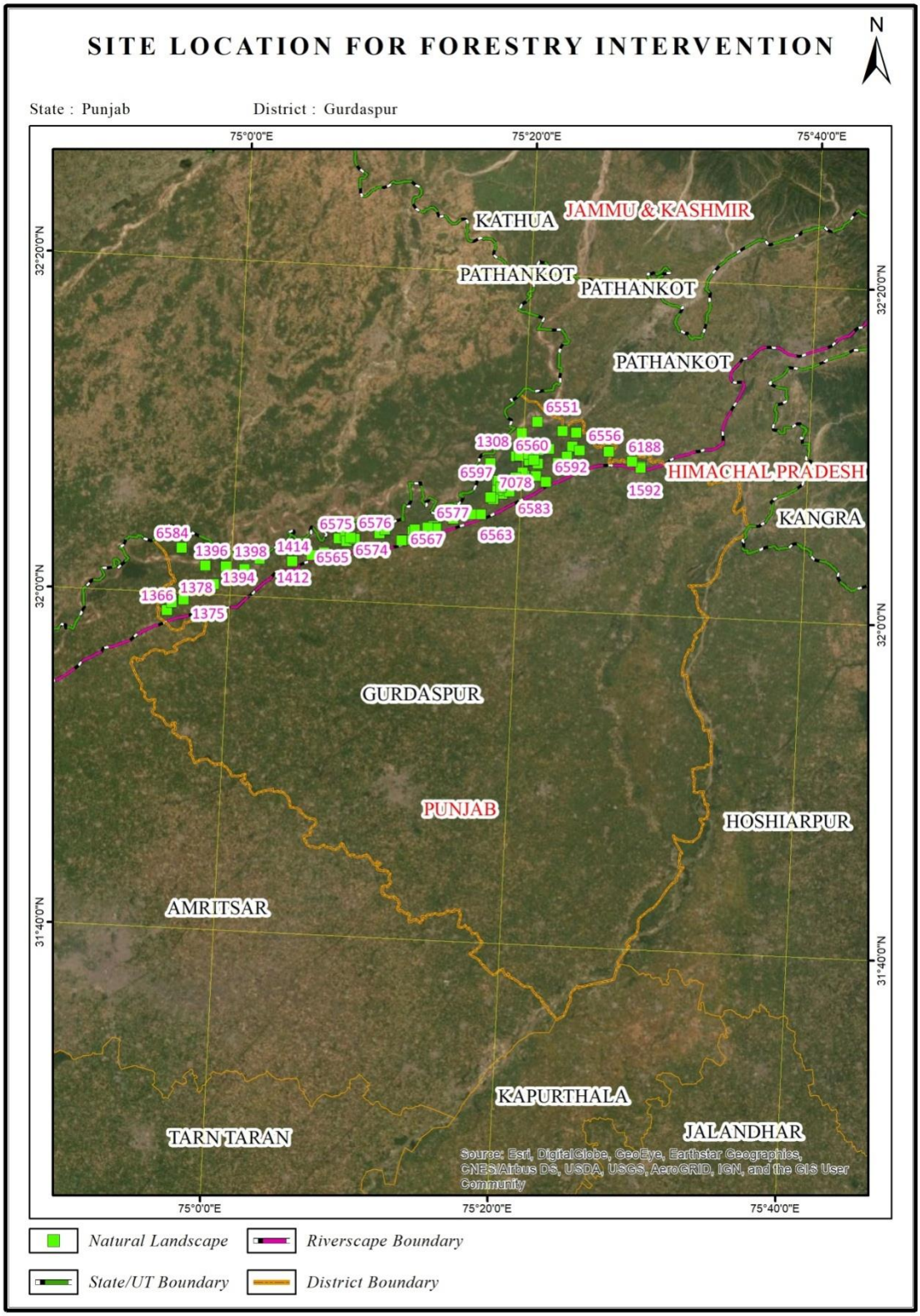
Site Locations For Soil and Moisture Conservation Measures Forestry Intervention in Punjab for Ravi River

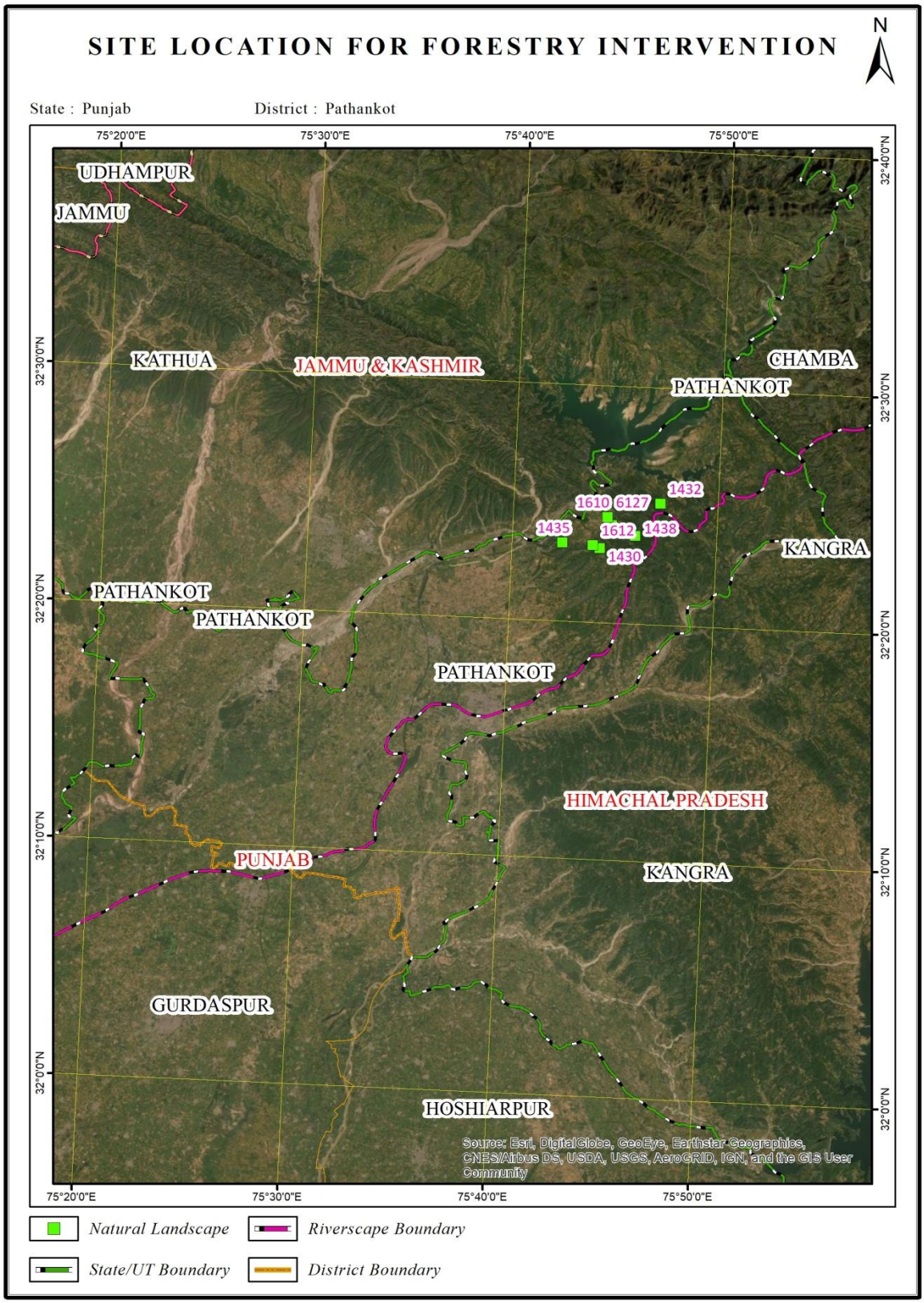


Site Locations For Soil and Moisture Conservation Measures Forestry Intervention in Punjab for Ravi River




SITE LOCATION FOR FORESTRY INTERVENTION
N
State : Punjab
District : Amritsar
74°40'0"E
75°0'0"E
75°20'0"E
32°0'0"N
31°40'0"N
31°20'0"N
PATHANKOT
GURDASPUR
AMRITSAR
PUNJAB
TARN TARAN
JALANDHAR
KAPURTHALA
JALANDHAR
JALANDHAR
7080
7083
7086
7069
7079
7084
7082
7064
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Natural Landscape
Riverscape Boundary
State/UT Boundary
District Boundary


SITE LOCATION FOR FORESTRY INTERVENTION
N
State : Punjab
District : Gurdaspur
75°0'0"E
75°20'0"E
75°40'0"E
32°20'0"N
32°0'0"N
31°40'0"N
KATHUA
JAMMU & KASHMIR
PATHANKOT
PATHANKOT
PATHANKOT
6551
1308
6560
6556
6188
6597
6592
7078
HIMACHAL PRADESH
1592
6583
6577
KANGRA
6584
6575
6576
6567
6563
1396
1398
1414
6565
6574
1394
1412
1378
1366
1375
GURDASPUR
PUNJAB
HOSHIARPUR
AMRITSAR
KAPURTHALA
JALANDHAR
TARN TARAN
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Natural Landscape
Riverscape Boundary
State/UT Boundary
District Boundary


SITE LOCATION FOR FORESTRY INTERVENTION
N
State : Punjab
District : Pathankot
75°20'0"E
75°30'0"E
75°40'0"E
75°50'0"E
32°40'0"N
32°30'0"N
32°20'0"N
32°10'0"N
32°0'0"N
UDHAMPUR
JAMMU
KATHUA
JAMMU & KASHMIR
CHAMBA
PATHANKOT
1610
6127
1432
1435
1612
1438
1430
KANGRA
PATHANKOT
PATHANKOT
PATHANKOT
HIMACHAL PRADESH
PUNJAB
KANGRA
GURDASPUR
HOSHIARPUR
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Natural Landscape
Riverscape Boundary
State/UT Boundary
District Boundary

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ANNEXURES

Annexure – 1: Logical Framework Analysis – The Ravi Riverscape Management

Project Strategy	**Objectively Verifiable Indicators**

Project Objectives and Outcomes	Project Output	Target	Indicator	Source of Verification	Risks and Assumptions
Project Goal - 1	**Riverscape Management:** Aiming a holistic riverine landscape (riverscape) approach for sustainable management of Ravi River, its banks, or its riparian areas, within its fluvial system.				
Outcome 1: Creation of an enabling environment for climate resilient, sustainable terrestrial, aquatic (river and wetlands), and floodplain ecosystem management.	**Project Objective 1:** To promote an enabling environment for sustainable land and river ecosystem-based management approaches focusing on reduced soil erosion, enhanced forest/ vegetation cover in the buffer zone, enhanced connectivity and e-flow, and ecological rejuvenation of Ravi River and its tributaries.				
	Output1.1 Enhanced levels and enabling environment created for: (a) multi-sector convergence, alliances, and integration; (b) Favourable national and state level policies (forests, agriculture, animal husbandry, watershed management, river management, tribal welfare, infrastructure development, and tourism) those reflect principles of climate resilience, sustainable land and ecosystem management, and mainstreaming biodiversity concerns in production sectors.	The target is to create an enabling environment wherein multiple agencies/ sectors working for various production sectors converge and adopt climate resilient and sustainable approaches of land and ecosystem management by mainstreaming biodiversity concerns. Various concerned sectors also work together so as to address gaps and inadequacies in realizing global and national policy objectives relevant to environment, biodiversity, water resources, climate change, and sustainable development.	Integration and convergence of line agencies and various production sectors initiated and notable progress made. Communities mobilized and their active engagement ensured. Biodiversity concerns mainstreamed in production sectors. Gaps and inadequacies in various policies reviewed and actions initiated to address them.	Periodic reports, proceedings of consultative process (workshops, meetings, seminars, etc). Mid-term and final independent evaluations.	Lack of enthusiasm on the part of stakeholders, inadequate sectoral integration, and lack of community participation in the implementation of existing and proposed policies and laws relating to conservation might hinder the promotion of local decision making and also their active engagement in the conservation agenda. Participation of communities particularly marginalized groups is weak due to a fear that their access to natural resources is going to be curtailed or restricted in ways that reduce the income they can derive. Conflict between conservation and local community

Project Strategy	Objectively Verifiable Indicators				
Project Objectives and Outcomes	**Project Output**	**Target**	**Indicator**	**Source of Verification**	**Risks and Assumptions**
					needs might create difficulty in achievement of intended outcomes. Sectoral departments/ agencies are reluctant, not open to integrate/ cooperate for climate resilient and sustainable land and ecosystem management approaches. Project benefits are not captured by intended beneficiaries due to lack of adequate measures, transparency, and appropriate compensation measures. Inadequate and inaccurate flow of information may result in misconceptions about the project and hence lead to opposition/ non-participation by some agencies and CSOs. Sectors/ agencies primarily responsible for reduced e-flows are rigid, and continue with conventional approaches resulting into

Project Strategy	Objectively Verifiable Indicators				
Project Objectives and Outcomes	**Project Output**	**Target**	**Indicator**	**Source of Verification**	**Risks and Assumptions**
					fragmentation of rivers, reduced e-flows, and decline in water quality.
	Output 1.2 Capacity of government officials and civil society organizations is developed in promoting community driven, climate resilient, sustainable land and ecosystem approaches, and holistic approach to management of river ecosystem.	Capacity of agencies, government officials and CSOs for sustainable land and ecosystem management, ecological rejuvenation and ecological integrity of river ecosystem is built.	Training need assessment carried out. Appropriate training learning material developed. Planned awareness and specialized training programmes on priority themes for various target groups successfully organized. Number of government staff and CSO representatives trained in climate resilient ecosystem management approaches.	Periodic reports, appraisal of training schedules, learning material and feedback obtained from trainee participants. Mid-term and final independent evaluations.	The concept and need of sustainable land and ecosystem management, and climate and its likely impact are not well appreciated by CBOs/ different sectors and agencies. The implementing agencies are new to the subject and expected outputs and outcomes and also widespread with limited financial management and technical capacity. Lack of interest and support for conservation might result in limited use of training facilities and opportunities. There are flaws in training need assessment and designing appropriate training programmes. Thus, trainings are not appealing and having desired impact.

Project Strategy	**Objectively Verifiable Indicators**				
Project Objectives and Outcomes	**Project Output**	**Target**	**Indicator**	**Source of Verification**	**Risks and Assumptions**
Project Goal-2	***Aviral Dhara, Nirmal Dhara*, Ecological Rejuvenation and Biodiversity Conservation:** Aim to address the drivers and stressors of river ecosystem and promote sustainable use by balancing ecological needs with livelihood needs.				
Outcome 2: Inter-agency and civil society driven, climate resilient approaches for appropriate forestry and other interventions demonstrated in adequate extents of natural, agriculture, and urban landscapes of the riverscape.	**Project Objective 2:** To carry out appropriate forestry interventions to restore river connectivity, enhance e-flow, improve water quality, and conserve the terrestrial and aquatic biota within the Ravi Riverscape.				
	Output 2.1 Plans to reduce/ check erosion in the mountainous region and floodplains of Ravi and its tributaries by appropriate soil and moisture conservation works and development of optimal strategy for riverbed mining. Sites of landslides are adequately treated and stabilized	Various soil and moisture conservation strategies and works in target area of 452920.5 m^3 proposed to be implemented.	Reduced erosion in the hilly tract, reduced and stabilized landslides, decreased bank erosion, and reduced sedimentation rate. Enhanced moisture regime and flow in streams and rivers.	Appraisal of reports on soil and moisture conservation works undertaken, site visits and field observations and assessments, monitoring reports on sedimentation.	Occurrence of natural calamities (e.g. cloudburst, flood, drought, earthquake, landslides, etc). Increase in biotic pressure and enhanced developmental activities (hydropower and road networks) in upstream area without adequate catchment area treatment.
	Output 2.2 Plans for restored and sustainably managed forest lands, agriculture lands in targeted villages and forestry interventions in urban environment for improved forest/ vegetation cover achieved. Enhanced assisted natural regeneration	Forestry interventions by way of various plantations under different treatment models to be undertaken. Plantations in 4790.35.ha Natural Landscapes,- 1267ha in Agriculture Landscapes, and 344.19 ha in Urban Landscapes are established and	Reduced biotic pressure on forests and improved regeneration. Improved forest cover in forest lands and TOFs in Himachal Pradesh, Punjab and J&K UT. Reduction in fuelwood extraction pressure on surrounding forests. Increase in average fodder yields, livestock grazing pressure reduced. Perennial vegetation cover increased on	Field level assessments and verification. Periodic reports on plantation works carried out. Biennial assessment on forest cover by FSI for Himachal Pradesh, Punjab and J&K UT.	Non-availability of suitable nursery techniques, planting material, inadequacies in plantation works i.e., preparation of plantation site, excavation of pits, poor quality of planting material, inadequate protection and constraints of watering, damage by livestock/

Project Strategy	Objectively Verifiable Indicators				
Project Objectives and Outcomes	**Project Output**	**Target**	**Indicator**	**Source of Verification**	**Risks and Assumptions**
	through improved protection and other measures.	maintained.	degraded lands. Private/community lands mobilized for reviving forest cover, enhancement of ecosystem health and services. Rejuvenation and renovation of existing community-based watershed structures.		wildlife, etc. Non-availability of lands (natural/ agriculture/ urban) for plantations and non-committal and inadequate support of local communities/ farmers/ urban agencies. Occurrence of natural calamities (e.g. cloudburst, flood, drought, etc.).
	Output 2.3 Plans for improved protected area management by implementing appropriate protection strategies, habitat management (e.g. weed control and water management), research and monitoring inputs, and enhanced capacity.	Strategies for improved PA management implemented, weed control works undertaken, research on priority themes planned and undertaken. Periodic ecological and socio-economic monitoring carried out. Training of frontline/ PA staff and other stakeholders planned and implemented.	Improved protected area management and enhanced management effectiveness. Increased diversity and abundance of species. Enhanced conservation values (e.g., catchment value, carbon sequestration, environmental amelioration, etc). Reduced human-wildlife conflict.	Appraisal of periodic reports and reports of mid-term and terminal evaluation. Report on Management Effectiveness Evaluation (MEE) for respective PAs. Reports on ecological and socio-economic monitoring.	Increased biotic pressure and adverse impact of developmental projects. Increased human-wildlife conflict and non-compatible land use in surrounding lands. Inadequate support of local communities and their engagement. Occurrence of natural calamities (e.g., cloudburst, flood, drought, earthquake, landslides, etc).
	Output 2.4 Plans for improved management of	Improved wetland management and sustainable	Improved and effective management of wetlands	Periodic reports, appraisal of conservation/	Enhanced biotic pressure, waste disposal, and more effluents,

Project Strategy	Objectively Verifiable Indicators				
Project Objectives and Outcomes	**Project Output**	**Target**	**Indicator**	**Source of Verification**	**Risks and Assumptions**
	prominent wetlands in the riverscape by protection, restoration, zoning, habitat management, and wise use of wetland resources.	use of wetland resources implemented.	accomplished. Wetland habitats restored, effective zone planning accomplished and sustainable wise use of wetland resources promoted.	management plans. Site visits and field level assessments. Questionnaire survey and stakeholder consultations.	unsustainable harvests, natural calamity (flood and heavy siltation). Inadequate support of local communities.
	Output 2.5 Plans for improved riverfronts and development of eco-parks.	Riverfronts and Eco-parks to be developed.	Improved Riverfronts, effective Eco-parks, reduced erosion.	Site visits and observations, periodic reports.	Non-compatible land use in surrounds of Riverfronts/ River, enhanced biotic pressure on eco-parks, damage of Riverfronts by excessive floods and mass congregation.
	Output 2.6 Plans for development of forest and river-based ecotourism.	Forest and river/ water resource-based ecotourism.	Healthy forests and rivers/ water resources are maintained. Reduced biotic pressure, ecologically sustainable, and socio-economically viable tourism developed.	Appraisal of periodic reports and ecotourism plans. Site visits and field assessments. Feedback from tourists.	Natural resources are depleted and degraded. Uncontrolled and unregulated mass congregation and adverse impacts.
Project Goal - 3	**Improved Ecosystem Services and Sustainable Livelihoods**: This goal aims to specifically seek enhanced ecosystem services and sustainable livelihoods.				
	Project Objective 3: To promote improved ecosystem services and support sustainable livelihood opportunities for local communities, particularly forest dwellers and fishermen.				
Outcome 3: Enhanced ecosystem services from natural (forest, river, and wetland ecosystems), agroecosystem and urban	*Output 3.1* Plans for reduced traditional forest dependence, developed alternate income	Reduced traditional forest dependence and alternate income generation options developed.	Sustainable livelihoods by way of improved/ enhanced natural resources, effective social institutions, better physical assets, enhanced incomes, improved and skilled human	Household surveys, periodic reports, field level assessments, evidences on reduced conflicts, etc.	Enhanced and frequent natural calamities, external market forces and impact of globalization, neglect and over exploitation of natural

Project Strategy	Objectively Verifiable Indicators				
Project Objectives and Outcomes	**Project Output**	**Target**	**Indicator**	**Source of Verification**	**Risks and Assumptions**
landscapes *Outcome 4*: Sustainable livelihoods, particularly of forest dwellers and fishermen	generation activities, improved livelihoods, and facilitate establishment of viable Small and Micro-Enterprises (SMEs).	Improved livelihoods and well-established small and micro-enterprises.	resource, reduced vulnerability, well established SMEs. Change in proportion of project participants who are living above the poverty line. Increase in earnings of families from involvement in sustainable management of degraded forest lands. Number of women participants in SMEs increased. Curtailment of distressed migrations. Number of SMEs operationalized.		resources by local communities.
	Output 3.2 Plans for enhanced levels of protection, conservation, and sustainable harvests of medicinal and aromatic plants and development of herbal gardens.	Conservation and sustainable harvests practices implemented for *in situ* and *ex situ* conservation of medicinal and aromatic plants.	Diversity, abundance, and productivity of medicinal and aromatic plants in wild are enhanced. Herbal gardens developed.	Appraisal of periodic reports, site visits, and field level assessments.	Inadequate marketing strategies and mechanisms. Fluctuating market demands, supply, and market rates.
Project Goal 4	**Effective Implementation, Knowledge Management, and Innovative Approaches:**This goal aims to ensure effective implementation of the project, knowledge management, development of innovative approaches (i.e., nursery techniques, afforestation, bio-filters and bioremediation), and adopt modern technology.				
Outcome 5 Capacities for adaptive	**Project Objective 4:** To adopt, integrate and implement innovative approaches and modern technology for rejuvenation of Ravi and its tributaries, knowledge management, enhanced capacity, and monitoring and evaluation.				

Project Strategy	Objectively Verifiable Indicators				
Project Objectives and Outcomes	**Project Output**	**Target**	**Indicator**	**Source of Verification**	**Risks and Assumptions**
management, learning, and replication of project lessons are developed.	*Output 4.1* Plans developed for integrated, science based, and community-based monitoring and assessment of impacts, as well as periodic evaluation of the project.	Improved research and monitoring capacity targeted. Adaptive management approach being implemented.	Improved research infrastructure, well designed monitoring system, enhanced scientific capacity, and effective documentation and dissemination of research and monitoring findings. Local level monitoring mechanisms setup. Learnings on best practices and models disseminated within and outside project villages.	Project/ research and monitoring reports. Peer reviewed publications, databases, improved natural resource management.	Inadequate support for research and monitoring, lack of incentives, inordinate delays in research permissions, isolationist approach of research and monitoring, inadequate management oriented research.
	Output 4.2 Plans for documentation of lessons learned and preparation of information dissemination products for wider audiences and applicability.	Innovative approaches for adaptive management of natural resources, particularly river ecosystem targeted. Successful implementation of community driven management of natural resources and river ecosystems implemented.	Successful and effective NRM and river management. Documentation of successful approaches in project design, development, and implementation. Case study on best practices developed.	Reports and periodic evaluation. Case studies and lessons learned, publications, and other documents.	Ineffective research and monitoring and adaptive management approaches. Lack of support for scaling up of riverscape conservation approaches. State level implementing agencies and partner organizations lack capacity to coordinate and monitor project effectively and ensure timely fund flows to landscape/ plantation/ treatment sites.

ANNEXURE-2: FIELD DATA FORMATS

2.1 DPR Preperation of forestry interventions for Ravi River, Proforma of data collection for proposed site

Set I ④

PREPARATION OF DETAILED PROJECT REPORT (DPR) FOR REJUVENATION OF INDUS RIVER BASIN THROUGH FORESTRY INTERVENTIONS

PROFORMA OF DATA COLLECTION FOR PROPOSED SITE HIMALAYAN FOREST RESEARCH INSTITUTE, SHIMLA, HIMACHAL PRADESH

(INDIAN COUNCIL OF FORESTRY RESEARCH & EDUCATION, DEHRADUN-248006)

A. FORESTRY INTERVENTIONS	NATURAL LANDSCAPE
B. MODEL NO.	*To be proposed PLANTATION*

C. TREATMENT SITE (DETAILS)

1.	NAME OF SITE	Kapei Ghar
2.	AREA (IN HECTARE)	3

D. GEOGRAPHICAL DETAILS

1.	Name of River	Ravi
2.	State	Himachal Pradesh
3.	District	Chamba
4.	Forest Circle	Chamba
5.	Forest Division	Dalhousie
6.	Forest Range	Bakloh
7.	Forest Block	Mail
8.	Forest Beat	Kandei
9.	Development Block Name	Bhattiyat
10.	Tehsil	Dalhousie
11.	Panchayat	Samleu

E. BASELINE DATA

1.	Current Status of Flora and Fauna	**Flora** Dalbergia sisoo, Bauhinia veriagata, Toona ciliata, Salix ,Kamal , Emblica officinalis, Syzygium cumini , Mangifera indica , Amaltash , lantana sps , **Fauna** Jungli cat , Jackel , Mongoos , Indian Fox , Leopard , Porcupine , Pig , Khaliz pheasant Red Jungle Fall etc
2.	Current land use	Forest Land
3.	Legal Status of land	Forest Land
4.	Geology and Soil type	Sandy Loam
5.	Slope	Moderate to steep
6.	Aspect	Sourthern
7.	Average Annual Rainfall (in mm)	1100 mm Average

8.	Special features of the site e.g. fire prone / landslides / mining areas / avalanche etc.	Degraded with open patches full of Lantana			
9.	Distance from Road (Approximate)	0- 300 M			
10.	Distance from Main River with Name of the river (Approximate)	850 M			
11.	Distance from Main Tributary with name of tributary (Approximate)	Kapei 100 m			
12.	Suggestive species for plantation	Acacia catechu, Dalbergia sisoo, Bauhinia veriagata ,Amaltash , Albizzia lebbeck , Terminalia arjuna , Bamboo			
13.	Pit Size	45 cm^3			
14.	Details of Fencing works, if required before plantation	RCC Fencing with 4 Strand B/Wire (940 Rmt)			
15.	Details of Soil Moisture and Conservation works, if required before plantation	Check Wall			
16.	Planting Cost including nursery cost (Approximate)	Attached			
17	Maintenance Cost of plantation with years (Approximate)	Attached			
18.	Remarks, if any				
19.	GPS coordinates of the site at all the corners (As per the shape of site, minimum 4 points are required)	1. N : 32°34'53.68"N 75°53'56.99"E Ele (m) 850	2. N : 32°34'58.60"N E: 75°54'1.32"E Ele (m)750	3. N : 32°35'1.64"N E: 75°53'56.17"E Ele (m) :750-	4. N : 32°35'3.17"N E: 75°53'51.45"E Ele (m) :749
		5. N : 32°34'56.19"N E: 75°53'51.41"E Ele (m) :808	6. N : 32°34'53.93"N E: 75°53'34.37"E Ele (m) :850		
F. ROUGH SKETCH OF TREATMENT SITE / MAP (AS AN ATTACHMENT)	Attached				
G. CURRENT PHOTOGRAPH (AS AN ATTACHMENT)	Attached				
Name and Designation **Sanjay Kumar Forest Guard**	**Contact Number** **9736824505**	**Signature of Forest Officer / Official**			

2.2 DPR for forestry intervention for Ravi River

Set - II

PREPARATION OF DETAILED PROJECT REPORT (DPR) FOR REJUVENATION OF INDUS RIVER BASIN THROUGH FORESTRY INTERVENTIONS

PROFORMA OF DATA COLLECTION FOR PROPOSED SITE

HIMALAYAN FOREST RESEARCH INSTITUTE, SHIMLA, HIMACHAL PRADESH

(INDIAN COUNCIL OF FORESTRY RESEARCH & EDUCATION, DEHRADUN-248006)

A. FORESTRY INTERVENTIONS	✓ AGRICULTURE LANDSCAPE
B. MODEL NO.	*To be proposed*

C. TREATMENT SITE (DETAILS)		
1.	NAME OF SITE	Bharian
2.	AREA (IN HECTARE)	0.15 ha

D. GEOGRAPHICAL DETAILS						
1.	Name of River	Satluj	Chenab	✓ Ravi	Beas	Jhelum
2.	State	✓ Himachal Pradesh		Punjab		Jammu & Kashmir
3.	District	CHAMBA				
4.	Forest Circle	CHAMBA				
5.	Forest Division	CHAMBA				
6.	Forest Range	L/ Rang CHAMBA				
7.	Forest Block	CHHABARU				
8.	Forest Beat	BHALKA				
9.	Development Block Name	MEHALA				
10.	Tehsil	CHAMBA				
11.	Panchayat	KUPADA				

E. BASELINE DATA		
1.	Current Status of Flora and Fauna	
2.	Current land use	Private land
3.	Legal Status of land	Private land
4.	Geology and Soil type	Clayed loamy
5.	Slope	Gentle

6.	Aspect	North- east
7.	Average Annual Rainfall (in mm)	22.15 mm
8.	Special features of the site	
9.	Distance from Road (Approximate)	100 mtr
10.	Distance from Main River with Name of the river (Approximate)	1 Km Ravi River
11.	Distance from Main Tributary with name of tributary (Approximate)	700 mtr Kaded Khad
12.	Suggestive species for plantation	Akhroot, Apple, Lemon
13.	Pit Size	60 x 60 x 60 cm
14.	Details of Fencing works, if required before plantation	R.C.C P/post
15.	Planting Cost including nursery cost (Approximate)	7500 / 2700 — 10200
16	Maintenance Cost of plantation with years (Approximate)	10000/ha
17.	Remarks, if any	

18.	GPS coordinates of the site at all the corners (As per the shape of site, minimum 4 points are required)	1. N : 32°32'20.9" E: 076°07'27.4" Ele (m) :	2. N : 32°32'17.0" E: 076°07'28.0" Ele (m) :	3. N : 32°32'29.20 E: 76°07'29.9" Ele (m) :	4. N : 32°32'22.84 E: 076°07'29.6" Ele (m) :
		5. N : E: Ele (m) :	6. N : E: Ele (m) :	7. N : E: Ele (m) :	8. N : E: Ele (m) :

F. ROUGH SKETCH OF TREATMENT SITE / MAP (AS AN ATTACHMENT)		
G. CURRENT PHOTOGRAPH (AS AN ATTACHMENT)		
Name and Designation Dharam Chand Forest Guard	Contact Number 94182-47932	Signature of Forest Officer / Official

2.3 DPR For forestry interventions for Ravi River

Set - III

PREPARATION OF DETAILED PROJECT REPORT (DPR) FOR REJUVENATION OF INDUS RIVER BASIN THROUGH FORESTRY INTERVENTIONS

PROFORMA OF DATA COLLECTION FOR PROPOSED SITE

HIMALAYAN FOREST RESEARCH INSTITUTE, SHIMLA, HIMACHAL PRADESH

(INDIAN COUNCIL OF FORESTRY RESEARCH & EDUCATION, DEHRADUN-248006)

A. FORESTRY INTERVENTIONS	URBAN LANDSCAPE
	a. Bioremediation & Bio-filtration b. River Front Development & Ecotourism ✓ c. Eco Park Development ✓ d. Institutional / Industrial Plantation e. Any Other (Please Specify.....)

B. SITE DETAILS		
1.	NAME OF SITE	Kuddhodi Mata Temple
2.	AREA (IN HECTARE)	0.50 ha
C. GEOGRAPHICAL DETAILS		
1.	Name of River	Satluj / Chenab / Ravi ✓ / Beas / Jhelum
2.	State	Himachal Pradesh ✓ / Punjab / Jammu & Kashmir
3.	District	CHAMBA
4.	Forest Circle	CHAMBA
5.	Forest Division	CHAMBA
6.	Forest Range	Lower Chamba
7.	Forest Block	Chhabarn
8.	Forest Beat	Kaded
9.	Development Block Name	Mehla
10.	Tehsil	Chamba
11.	Name of Sub Urban Area /Town	
12.	Municipal Corporation /Committee/ Notified Area Committee (NAC)	

D. BASELINE DATA		
1.	Current land use	forest land
2.	Land Use Status five years ago	forest land
3.	Legal Status of land	forest land
4.	Soil Type	Clayey loam, Covered with Grass

5.	Average Annual Rainfall (in mm)	940 mm			
6.	Special features of the site	Temple			
7.	Distance from Road (Approximate)	4-6 KM			
8	Distance from Main River with Name of the river (Approximate)	5-8 KM			
9.	Distance from Main Tributary with name of tributary (Approximate)	1-2 KM			
10.	Suggestive species for plantation				
11.	Pit Size				
12.	Details of Fencing works, if required				
13.	Planting Cost including Nursery Cost (Approximate)				
14.	Maintenance Cost of plantation with years (Approximate)				
15.	Remarks, if any				
16.	GPS coordinates of the site at all the corners (As per the shape of site, minimum 4 points are required)	1. N : 32°29'58" E: 76°06'32" Ele (m) :	2. N : 32°30'08" E: 76°06'32" Ele (m) :	3. N : 32°30'04" E: 76°06'27" Ele (m) :	4. N : 32°30'01" E: 76°06'27" Ele (m) :
		5. N : 32°30'02" E: 76°06'30" Ele (m) :	6. N : E: Ele (m) :	7. N : E: Ele (m) :	8. N : E: Ele (m) :
F. ROUGH SKETCH OF TREATMENT SITE (AS AN ATTACHMENT)					
G. CURRENT PHOTOGRAPH (GEOREFRENCED FROM ONE CORNER AS PER POINT No. 16. (AS AN ATTACHMENT)					

G. SITE SPECIFIC ACTIVITIES

S. NO.	YEAR	NAME OF ACTIVITIES	UNIT (AREA/ NO.)	FINANCIAL OUTLAY (IN RS.)
1.	2021-22	Construction of Temple & Eco Park for Tourism	0.50 ha	10,00,000/-
		GRAND TOTAL		10,00,000/-

Name and Designation	Contact Number	Signature of Forest Officer / Official
Rohit Kumar Forest Guard	85804-57853	

2.4 DPR for forestry interventions for Ravi River

S.No. - IV

PREPARATION OF DETAILED PROJECT REPORT (DPR) FOR REJUVENATION OF INDUS RIVER BASIN THROUGH FORESTRY INTERVENTIONS

PROFORMA OF DATA COLLECTION FOR PROPOSED SITE HIMALAYAN FOREST RESEARCH INSTITUTE, SHIMLA, HIMACHAL PRADESH

(INDIAN COUNCIL OF FORESTRY RESEARCH & EDUCATION, DEHRADUN-248006)

A. OTHER INTERVENTIONS		**SOIL & WATER CONSERVATION**
B. MODEL NO.		
C. TREATMENT SITE (DETAILS)		
1.	NAME OF SITE	**Katori** (Including Nallas of Katori DPF , Chalela No 1 DPF , Chalela No 2 DPF , Chhamber DPF ,)
2.	AREA (IN HECTARE)	
D. GEOGRAPHICAL DETAILS		
1.	Name of River	Ravi
2.	State	Himachal Pradesh
3.	District	Chamba
4.	Forest Circle	Chamba
5.	Forest Division	Dalhousie
6.	Forest Range	Bakloh
7.	Forest Block	Nainikhad
8.	Forest Beat	Katori
9.	Development Block Name	Bhattiyat
10.	Tehsil	Bhattiyat
11.	Panchayat	Tunuhatti
E. BASELINE DATA		
1.	Current Status of Flora and Fauna	Pinus roxburgii, Acacia catechu, Dalbergia sisoo, Bauhinia veriagata,Toona ciliata, Bamboos,Salix , Emblica officinalis, Syzygium cumini , Mangifera indica , Amaltash , Albizzia lebbeck , Oie , lantana sps , Pyrus pashia & Jungli cat , Jackel , Mongoos , Indian Fox , Leopard , Porcupine , Pig , Monal , Khaliz pheasant etc.
1.	Current land use	Forest Land
2.	Legal Status of land	Forest Land
3.	Geology and Soil type	Sandy Loam
4.	Slope	Moderate to steep

5.	Aspect	Nothern			
6.	Average Annual Rainfall (in mm)	1250 mm Average			
7.	Special features of the site e.g. fire prone / landslides / mining areas / avalanche etc.	Sliding Area			
8.	Distance from Road (Approximate)	1 KM			
9.	Distance from Main River with Name of the river (Approximate)	3 KM (Ravi River)			
10.	Distance from Main Tributary with name of tributary (Approximate)	Katori , Chhamber , Duala Danga , Dher etc			
11.	Remarks, if any				
12.	GPS coordinates of the site at all the corners (As per the shape of site, minimum 4 points are required)	1. N 32°27'37.27"N 75°53'59.64"E Ele (m) 790	2. N : 32°27'43.12"N E: 75°53'52.31"E Ele (m) 720	3. N :32°27'44.53"N E: 75°54'9.07"E Ele (m) :835	4. N :32°27'48.20"N E: 75°54'5.17"E Ele (m) :796
		5. N 32°27'45.41"N 75°53'50.24"E Ele (m) 706	6. N : 32°27'49.81"N E: 75°54'7.04"E Ele (m) :810	7. N :32°27'48.87"N E: 75°53'57.92"E Ele (m) 745	8. N :32°27'54.91"N E: 75°53'57.49"E Ele (m) :785
		9. N :32°27'50.11"N E: 75°53'55.48"E Ele (m)735	10. N : 32°27'56.18"N E: 75°53'54.14"E Ele (m) :770	11. N :32°28'4.43"N E: 75°54'17.48"E Ele (m) 860	12 N :32°28'2.07"N E: 75°54'2.85"E Ele (m) :750
		13. N :32°28'6.75"N E 75°54'18.06"E Ele (m) 880	14. N : 32°28'7.37"N E: 75°54'4.35"E Ele (m) :760	15. N :32°28'15.99"N E: 75°54'17.19"E Ele (m) 905	16. N : 32°28'15.80"N E: 75°54'16.96"E Ele (m) :902
		17. N :32°28'16.00"N E: 75°53'44.71"E Ele (m) 765	18. N : 32°28'3.72"N E: 75°53'24.95"E Ele : 660	19. N 32°28'17.67"N E: 75°53'30.50"E Ele (m)760	20. N 32°28'4.59"N E:75°53'21.72"E Ele (m) :660
		21. N : 32°28'22.39"N E: 75°53'19.88"E Ele (m)730	22. N : 32°28'15.27"N E: 75°53'7.53"E Ele : 640	23. N : 32°28'28.22"N E: 75°53'12.21"E Ele (m)695	24. N : 32°28'34.31"N E: 75°52'57.39"E Ele (m)610
		25. N : 32°28'42.57"N E: 75°52'58.72"E Ele (m) 665	26. N 32°28'37.58"N E: 75°52'54.01"E Ele : 605	27. N : 32°28'51.42"N E: 75°52'47.66"E Ele (m)630	28. N : 32°28'46.69"N E: 75°52'39.92"E Ele (m) 590
F. ROUGH SKETCH OF TREATMENT SITE / MAP (AS AN ATTACHMENT)		Attached			
G. CURRENT PHOTOGRAPH (AS AN ATTACHMENT)		Attached			

N=North; E=East; Ele=Elevation; m=meter,

Annexure – 3: Description of Soil Types within the Ravi Riverscape

Sr.No.	Soil type	Description
1	**Dystric Eutrochrepts**	Deep, well drained, thermic, fine-loamy soils on very steep slopes with loamy surface and severe erosion
2	**Dystric Fluventic Eutrochrepts**	Deep, well drained, thermic, fine-loamy soils on very steep slopes with loamy surface and severe erosion. Soil formed in alluvium in floodplains along streams and rivers. Soil is used for corn, soyabean, tobacco etc.
3	**Fluventic Eutrochrepts**	This soil formed in calcareous alluvium in floodplains along streams and rivers. The content of organic carbon decreases irregulary with depth or it is relatively high at depth. Soil is used for cotton and soyabean.
4	**Lithic Cryorthents**	Poorely developed soils, semi-permanent snow, bank is simply a thin sandy A-horizon over a C-horizon
5	**Lithic Udorthents**	TRhese soils have a lithic contact within 50 cm of the surface. Thay are otherwise like typic Udorthents except that possibly some of them have very high biological activity above the Lithic contact.
6	**Typic Cryorthents**	Soils of glacio-gluvial valley with moderate slopes occupied with moderately shallow, excessively drained, sandy-skeletal, neutral to slightly acidic, moderately eroded, and strongly stony.
7	**Typic Eutrochrepts**	Deep, well drained, thermic, fine-loamy, calcareous soils on moderately steep slopes with loamy surface and severe erosion
8	**Typic Udifluvents**	Have moderately good or good drainage, occur in relatively high areas on flood plains, and the water table is deeper than 50 cm all of the time
9	**Typic Udorthents**	Found on moderate to steep slopes, are slightly to moderately acidic, moderately eroded, and moderate to strong stony
10	**Typic Ustifluvents**	Very deep imperfectly drained fine soils occurring on flat to nearly level active alluvial plain.
11	**Typic Ustipsamments**	Sand that have deep ground water and a thick regolith
12	**Typic Ustochrepts**	Coarse-loamy soils derived from mixed alluviam or residium weathered from sand stone and shale
13	**Typic Ustorthents**	Soils those are deep or moderately deep to hard rock and those do not have ground water within 150 cm
14	**Udic Ustochrepts**	Coarse-loamy soils derived from mixed allluviam or residium weathered from sand stone and shale

15	**Non Soil**	Areas that do not support plant growth are not considered but mapped. These may be glaciers, bedrock outcrops, urban land, active quarries, etc.

Annexure-4: List of Suggested Plant Species with Uses for Planting in Natural, Agricultue and Urban Lanscapes

Sl No	Botanical Name	Common Name	Habit	Special Attributes
1	*Senegalia catechu* (L.f.) Willd.	Khair	Tree	Used for diarrhea, reduce the swelling of throat and nose. It has timber, fodder and medicinal values.
2	*Acacia nilotica* (L.) Delile	Babul, Kikar	Tree	Used for the treatment of human immunodeficiency virus, hepatitis C virus and cancer and also use in timber, fodder and fuel.
3	*Acer acuminatum* Wall.	Tapering leaf mapple	Tree	Used as timber and its leaves are used for making tea and fodder.
4	*Acer caesium* Wall. ex Brandis	Kainju	Tree	Bark is used externally to treat muscular swellings, boils and pimples. Burrs sometimes, made into cups and used as Timber.
5	*Acer cappadocicum* Gled.	Maple	Tree	Used for fuel and woodcarvings. Plant has been suggested as of value in soil stabilization in dry valleys in Turkey, and fodder.
6	*Acer pictum* Thunb.	Yellow paint maple	Tree	Locally used as ornamental plant, food, medicine and source of wood. The leaves are an irritant and the bark is astringent.
7	*Achillea millefolium* L.	Common yarrow, Puthkanda	Herb	Aerial parts of the plant are used to encourage bile flow, and as a diuretic. Alkaloids extract from the leaves have anti-inflammatory and analgesic activity.
8	*Aconitum heterophyllum* Wall. ex Royle	Atish, Patees	Herb	Used as analgesic, anti-inflammantory, anti-pyretic, aphrodisiac and astringent.
9	*Aconitum violaceum* Jacq. ex Stapf.	Dudhia-bis, Mitha Telia, Tilla	Herb	Used in the treatment of snake and scorpion bites, contagious infections and inflammation of the intestines. It also exhibits antidote, anti-inflammatory and febrifuge properties.
10	*Aegle marmelos* (L.) Correa	Bel, Bael	Tree	Bael fruits are used in the treatment of dysentery, peptic ulcers and as a laxative and chronic diarrhea to recuperate from respiratory affections in various folk medicines.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
11	*Aesculus indica* (W9all.ex Cam10bess.) Hook.11	Pangar,Bankhor, Kandur	Tree	Used to cure skin diseases, rheumatism, as an astringent, acrid and narcotic, and in the relief of headaches. Also used as Timber.
12	*Agropyron* spp.	Wheat grass	Grass	Used as forage and in erosion control.
13	*Agrostis gigantea* Roth.	Black bent grass	Grass	Used as a fodder and forage species. Also used as a lawn/turf grass for revegetation purposes and for erosion control.
14	*Agrostis munroana* Aithc. & Hemsl.	Velvet bent grass	Grass	Used as fodder and soil erosion control.
15	*Agrostis pilosula* Trin.	Grass	Grass	Used as fodder and soil erosion control.
16	*Ailanthus excelsa* Roxb.	Indian tree of Heaven, Mahanimb, Maharukh	Tree	Plant used in medicine as the gum and the bitter, aromatic leaves are reported to have medicinal properties. The bark is a febrifuge and can be used as a treatment against asthma, bronchitis and dysentery. The leaves and bark are also in good repute as a tonic that is used after labor.
17	*Ainsliaea aptera* DC.	Karubuti	Herb	Used in the treatment of stomachache, constipation and acute fever.
18	*Ajuga* spp.	Neel Kanthi	Herb	Used to cure fluid retention, coughs, pain and swelling (inflammation).
19	*Albizia chinensis* (Osbeck) Merr.	Silk tree, Kala siris	Tree	It is helpful for slope stabilization and soil improvement. Its wood has low density and used as timber.
20	*Albizia procera* (Roxb.) Benth.	Siris, Siras	Tree	The cooked leaves are eaten as a vegetable. Decoction of the bark is given for the treatment of rheumatism and haemorrhage. It is also considered useful in treating problems of pregnancy and for stomachache. The leaves are poulticed onto ulcers.
21	*Albizia* spp.	Vaakaveru, Siris , Shirish, Sirisa	Tree	Used as medicinal, fodder and timber.
22	*Allium humile* Kunth	Kunth	Herb	Used for the treatment of stomach diseases, asthma, jaundice, cold and cough.
23	*Alnus nitida* (Spach) Endl.	Piak, Kosh	Tree	A decoction of the bark is applied externally to treat swellings and body pains.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
24	*Alopecurus aequalis* Sobol.	Grass, Orange foxtail	Grass	Used in the treatment of oedema, chickenpox and snakebites. The whole plant is antiphlogistic, depurative and diuretic. The seed is small and fiddly, it is very much a famine food.
25	*Alopecurus nepalensis* Trin. ex Steud.	Nepal foxtail grass	Grass	Used as food, fodder and for soil conservation.
26	*Alpinia* spp.	Shell-flower	Herb	Used to cure fever, muscle spasms, intestinal gas, bacterial infections and inflammation.
27	*Alstonia scholaris* (L.) R.Br.	Scholar's tree, Sapatparnachal, Satveen	Tree	Plant has antibacterial, antidiabetic, anticancer, antianxiety, hepatoprotective, anti-inflammatory and analgesic effects.
28	*Angelica glauca* Edgew.	Chaura, Choru, Corakah	Herb	Used in the treatment of constipation, dyspepsia, infantile atrophy, dysentery, menorrhagia, and rinderpest.
29	*Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guillem. & Perr.	Dhawada, Dhaura, Dhava	Tree	Used to cure skin diseases, snake and scorpion bites, stomach diseases, leprosy, diabetes, colic, cough and diarrhea.
30	*Anogeissus* spp.	Dhau	Tree	Used as fodder, fuel, timber and also exhibit some medicinal properties.
31	*Anthocephalus cadamba* (Roxb.) Miq.	Kadamba, Kadam	Tree	Used for uterine complaints, fever, skin diseases, inflammation, dysentery, anemia and leprosy.
32	*Apluda mutica* L.	Tachula grass	Grass	Used as fodder and for soil conservation.
33	*Araucaria araucana* (Molina) K.Koch	Monkey puzzle tree, Chilean pine	Tree	It is an ornamental tree with valuable timber and seeds are edible.
34	*Arnebia benthamii* (Wall. ex G. Don) I.M. Johnst.	Baalchar	Herb	*Arnebia benthamii* has anti-inflammatory, antifungal and wound-healing properties.
35	*Arundinella nepalensis* Trin.	River grass	Grass	Used as fodder and for soil conservation.
36	*Arundinella pumila* (Hochst.) Steud.	Dwarf reedgrass	Grass	Used as fodder and for soil conservation.
37	*Arundo donax* L.	Giant reed grass	Grass	Used as fodder and for soil conservation.
38	*Azadirachta indica* A.Juss.	Neem	Tree	Neem leaf is used for the treatment of eye disorders, leprosy, loss of appetite, skin ulcers, bloody nose, intestinal worms, stomach upset, diseases of the heart and blood vessels (cardiovascular disease),

Sl No	Botanical Name	Common Name	Habit	Special Attributes
				fever, diabetes, gum disease (gingivitis) and liver problems.
39	*Bambusa bambos* (L.) Voss	Bambos	Bamboo	Used for making ladders and bridges. Leaves are used as fodder.
40	*Bambusa* spp.	Bamboo	Bamboo	The stems are used as fodder and for construction and fencing. And also used for tool handles, weapons, furniture, handicrafts, stakes, pots, irrigation pipes and bows for fishing nets.
41	*Bauhinia variegata* L.	Kachnar	Tree	Alleviates Kapha and Pitta. Alleviates glandular swellings skin disorders, alternative, etc. Antihelminthic, Amoebic dysentery, Anti-tumour, Anti-microbial, Anti-inflammatory, Anti-goitrogenic, Hepatoprotective.
42	*Berberis lycium* Royle	Kashmal	Shrub	Used for the treatment of diabetes, jaundice, eye infections, fractured bones, internal wounds, rheumatism, stomachache and diarrhea.
43	*Berberis* spp.	Daruhaldi, Rasnajan, Kilmora	Shrub	Used to cure cough, fever, depression, liver disease, hyperlipidemia, hyperglycemia and bleeding.
44	*Bergenia ciliata* (Haw.) Sternb.	Pathar chata, Pashanbedh	Herb	Used for the treatment of kidney stones.
45	*Bergenia stracheyi* (Hook.f. & Thom.) Engl.	Pashanbeha	Herb	Mostly used for the removal of kidney and urinary tract stones due to its antilithic property.
46	*Betula alnoides* Buch.-Ham. ex D.Don	Kath bhuj	Tree	It is considered to be an antidote against snakebites and is used to treat dislocated bones.
47	*Betula utilis* D.Don	Bhoj patra	Tree	It is considered to be highly astringent agent. By virtue of such quality its external use is recommended as styptic (to stop bleeding) and to stop any purulent discharge. Hence it is used more often to clean the wounds.
48	*Boerhavia diffusa* L.	Punarnava,Punarnava rakta, Rakta punarnava	Herb	Used for its anti-diabetic and diuretic properties, pain relief, anti-inflammation, and treating indigestion.
49	*Bombax ceiba* L.	Simbal	Tree	Used in the treatment of dysentery, haemoptysis in pulmonary tuberculosis, influenza and menorrhagia.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
50	*Bothriochloa intermedia* (R.Br.) A.Camus	Bluestem grass	Grass	It is widely used as a fodder and a graze for livestock.
51	*Bothriochloa parviflora* (R.Br.) Ohwi	Grass, Blue grass	Grass	Used as fodder and for soil conservation.
52	*Bothriochloa pertusa* (L.) A. Camus	Couch grass	Grass	Used as fodder and for soil conservation.
53	*Bougainvillea* spp.	Boonganbel	Tree	It has anticancer, antidiabetic, antihepatotoxic, anti-inflammatory, antihyperlipidemic, antimicrobial, antioxidant, and antiulcer properties.
54	*Brachypodium sylvaticum* (Huds.) P.Beauv.	False brome	Grass	Used as fodder. It creates the perfect habitat for rodents that damage tree seedlings and in oak woodlands false brome can suppress the germination of oak seedlings.
55	*Bromus himalaicus* Stapf.	Brome grass	Grass	Used as fodder and for soil conservation.
56	*Bromus ramosus* Huds.	Grass	Grass	Used as fodder and for soil conservation.
57	*Butea monosperma* (Lam.) Taub.	Flame of forest, Palash	Tree	The use of its gum as external astringent application is mentioned by 'Chakradatta'. The leaves are good have astringent, depurate, diuretic and aphrodisiac in pharmacological properties.
58	*Calamagrostis montanensis* (Suribn.) Suribn ex Vosey	Grass	Grass	Used as fodder and for soil conservation.
59	*Calamagrostis* spp.	Garhwal reedgrass	Grass	It has soil stabilizing properties and also used as fodder.
60	*Callistemon citrinus* (Curtis) Skeels	Bottle brush	Tree	Used for the treatment of diarrhoea, dysentery and rheumatism and also as ornamental tree.
61	*Capparis decidua* (Forssk.) Edgew.	Caper berry, Kair	Shrub	Used to cure arthritis, toothache, asthma, cough, inflammation, intermittent fevers, malaria, rheumatism, and swelling.
62	*Carissa opaca* Stapf. ex Haines	Karabda , Karonda	Shrub	Used as remedy for hepatitis, jaundice, fever and asthma.
63	*Carpinus viminea* Wall. ex Lindl.	Himalayan hornbeam	Tree	Used as fodder, fuel and timber.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
64	*Cassia fistula* L.	Amaltas, Golden shower tree	Tree	Used as edible, widely used as a laxative and for fodder.
65	*Causarina* spp.	Kasurina	Tree	Used as fuel wood and timber
66	*Cedrus deodara* (Roxb. ex D.Don) G.Don	Deodar, Diar, Devda	Tree	Used as timber, fuel, religious and making of cedar oil etc.
67	*Celtis australis* L.	Khirk	Tree	Used in the treatment of dysentery, diarrhea and peptic ulcers and aslo as fodder and fuel.
68	*Chrysopogon fulvus* (Spreng.) Chiov.	Dholu, Goria, Reddish-yellow beardgrass	Grass	Used as fodder, used for grazing, as a lawn grass, and to control soil erosion.
69	*Chrysopogon gryllus* (L.) Trin.	Scented grass	Grass	Used as fodder and covering house roof.
70	*Chrysopogon serrulatus* Trin.	Grass	Grass	Used as fodder, widely used as cooling agent, tonic and blood purifier.
71	*Cinnamomum tamala* (Buch.-Ham.) T.Nees & Eberm.	Indian bay leaf, Tej patta	Tree	Used for the treatment of asthma, diabetes, bad breath, excessive crying in infants (colic), common cold, complications after childbirth, cough and diarrhea.
72	*Citrus limon* (L) Osbeck	Nimbu	Shrub	Used as edible fruit, in treatement of high blood pressure and common cold and rich source of Vitamin C,
73	*Cordia myxa* L.	Indian cheery	Tree	Used in folk medicine to cure cough and chest complaints, as well as for the treatment of wounds and ulcers.
74	*Cornus capitata* Wall.	Himalayan strawberry	Tree	Used as an astringent.
75	*Cornus macrophylla* Wall.	Karchan	Tree	Fruits are edible, used as fuel and fodder.
76	*Cornus oblonga* Wall.	Oblong-Petal Dogwood	Shrub	Used in folk remedies to cure arthritis and injuries.
78	*Corylus jacquemontii* Decne	Findak, Kabasi, Bhotia badam	Tree	Used as edible, fodder and fuel.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
79	*Cotoneaster bacillaris* Wall. ex Lindl.	Riyuns, Rockspray cotoneaster, Khareto	Shrub	Used as medicine, walking stick, edible, fuel and fodder.
80	*Cryptomeria japonica* (Thunb. ex L.f.) D.Don	Japanese cedar, Red cedar	Tree	It exhibit medicinal properties and timber is used for the making of staves, tubs, casks, furniture and other indoor applications and aslo an ornamental plant.
81	*Cupressus torulosa* D. Don	Himalayan cypress, Surai	Tree	Used as timber and essential oils, building and furniture making.
82	*Cymbopogon citratus (DC). Stapt*	Lemon grass	Grass	Used in pharmaceutical industries for essential oil and also used for soil conservation
83	*Cymbopogon distans* (Nees ex Steud.) W. Watson	Lemon grass	Grass	Used as essential oil and medicinal, perfumery, cosmetics, and in the pharmaceutical industries.
84	*Cymbopogon martinii* (Roxb.) W.Watson	Ginger grass, Rohisa	Grass	It exhibits exceptionally good antimicrobial, antifungal, antiviral, antihelminthic, antioxidant and cytotoxic properties.
85	*Cyperus rotundus* L.	Nut sedge, Coco grass	Herb	Used for the treatment of diabetes, pyresis, diarrhea, inflammation, malaria and stomach and bowel disorders.
86	*Dactylis glomerata* L.	Cat grass	Grass	Used as fodder and soil conservation.
87	*Dactylorhiza hatagirea* (D.Don) Soo	Salampanja, Hathpanja	Herb	Used for the treatment of pyorrhea (inflammation of the gum and teeth). Root paste applied on cuts and wounds, religious and aphrodisiac.
88	*Dalbergia sissoo* DC.	Sheesham	Tree	Used as timber and also for the treatment of skin ailments and gonorrhea. Ayurvedics prescribe the leafy juice for eye ailments, the woody bark paste as anthelmintic, antipyretic and analgesic. The wood is also used in India for boils, leprosy and nausea.
89	*Danthonia cumminsii* Hook.f.	Heathgrass, Wallaby grass, Oat grass	Grass	Used as fodder and for soil conservation.
90	*Danthonia* spp.	Oatgrass, Heathgrass	Grass	Used as fodder and for soil conservation.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
91	*Daphne papyracea* Wall. ex G.Don	Satpura, Dhak chamboi	Shrub	The plant is bitter, febrifuge and purgative. Also used for paper preparation
92	*Daphne* spp.	Satpura	Shrub	The plant is febrifuge and purgative. Also used for paper preparation.
93	*Debregeasia hypoleuca* (Hochst. ex A.Rich.) Wedd.	Shiaru	Shrub	Used for soil conservation and the fibre is used for making ropes.
94	*Delphinium cashmerianum* Royle	Kashmir larkspur	Herb	Useful in curing aconite poisoning, fungal infection and toothache.
95	*Dendrocalamus* spp.	Baans	Grass	Young shoots used as fodder, stem are used as furniture and for construction purposes.
96	*Dendrocalamus hamiltonii* Nees & Arn. ex Munro	Kako bamboo, Tama bamboo	Grass	Edible young shoots, fodder and commercial used for construction purposes.
97	*Dendrocalamus strictus* (Roxb.) Nees	Calcutta bamboo, Hard bamboo	Grass	Used as timber and for construction purposes.
98	*Deschampsia* spp.	Ghas	Grass	Used as fodder and for soil conservation.
99	*Desmodium* spp.	-	Shrub	The plant has aphrodisiac, analgesic, diuretic and haemorrhagic properties.
100	*Desmodium elegans* DC.	Chamlai, Elegant desmodium	Shrub	The roots are carminative, diuretic and tonic. The juice of the root, sometimes combined with the bark juice of *Bauhinia malabarica*, is used in the treatment of cholera.
101	*Desmodium gangeticum* (L.) DC.	Shalparni, Salparni, Dhruva	Herb	The plant has febrifuge, aphrodisiac, analgesic, diuretic, inate a ammatory and haemorrhagic properties. It is used to cure postnatal complaints, inate a, chronic fever, biliousness, cough, vomiting, and asthma. It is an important ingredient of dasmoolarishta and chyavanprash.
102	*Deutzia corymbosa* (Airy Shawl) Zaik.	Beans Tree	Shrub	The plant is known to clear toxins and activate blood circulation.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
103	*Deutzia* spp.	Ghugtai,	Shrub	Used as an ornamental plant.
104	*Deutzia staminea* R.Br. ex Wall.	Ghugtai, Dalochi	Shrub	The plant is known to clear heat and toxins and activate blood circulation.
105	*Dichanthium annulatum* (Forssk). Stapf.	Marvel grass, sheda grass	Grass	Used as fodder and for soil conservation.
106	*Diospyros edulis* Lodd.	Black sapote	Tree	Fruits are astringent, caustic and bitter.
107	*Diospyros kaki* L.f.	Japani fal	Tree	Fruits are edible.
108	*Diospyros lotus* L.	Date plum	Tree	Fruits are edible and rich in sugar, malic acid and vitamins
109	*Diospyros montana* B.Heyne ex A.DC.	Bistendu, Kala dhao	Tree	The fruit juice is applied to wounds and ulcers and is drunk in cases of dysentery and fever; it possesses antibacterial and antihelminthic activities. Also used as fodder and fuel.
110	*Diospyros* spp.	Bistendu, Kala dhao	Tree	It exhibits medicinal properties. And also used as timber.
111	*Drepanostachyum falcatum* (Nees) Keng f.	Cane	Grass	The canes are used for making hats, baskets, rods, etc.
112	*Eichhornia* spp.	Water hyacinth	Herb	Used as biomass for biogas production.
113	*Elaeagnus conferta* Roxb.	Wild olive	Shrub	Used as antioxidant, antimicrobial, analgesic and anti-inflammatory.
114	*Eragrostis nigra* Nees ex Steud.	Grass	Grass	Used as fodder and soil conservation.
115	*Erianthus filifolius* ex Steud.	Grass	Grass	Used as fodder and soil conservation.
116	*Erianthus rufipilus* Griseb.	-	Grass	Used as fodder and soil conservation.
117	*Erianthus spp.*	Grass	Grass	Used as fodder and soil conservation
118	*Eriobotrya japonica* Thunb.	Loquat	Shrub	Leaves are analgesic, antibacterial, antiviral, astringent and diuretic. Young shoots are used as intestinal astringent and mouth wash.
119	*Eucalyptus comaldulensis* Dehnh.	River red gum	Tree	Used as timber
120	*Eucalyptus* spp.	Safeda	Tree	Used as timber.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
121	*Eucalyptus tereticornis* Sm.	Red irongum	Tree	Used as timber and for railway sleepers. Leaves are good source of eucalyptus oils.
122	*Eulaliopsis binata* (Retz.) C.E.Hubb.	Bal vaja, Sabai grass, Babni	Grass	Used as soil binder and making brooms.
123	*Euonymus* spp.	Dadul, Dharua	Shrub	Wood is traditionally used for the making of spindles for spinning wool. Also used as ornamental plant.
124	*Festuca arundinacea* Schreb.	Tall fescue	Grass	It is used as an ornamental grass and used for polluted soil remediation.
125	*Festuca pratensis* Huds.	Blue grass	Grass	It is used as an ornamental grass and used for polluted soil remediation.
126	*Festuca valesiaca* Schleich.ex Gaudin	Blue grass	Grass	Used as fodder and soil binder.
127	*Ficus benghalensis* L.	Bargad, vata, Vatathwak, Aal	Tree	Astringent to bowels; useful in the treatment of biliousness, ulcers, erysipelas, vomiting, vaginal complaints, fever, inflammations, leprosy etc.
128	*Ficus racemosa* L.	Gular, Umbar chal, Lakh papal	Tree	Used for the treatment of various diseases/disorders including diabetes, liver disorders, diarrhea, inflammatory conditions, hemorrhoids, respiratory and urinary diseases.
129	*Ficus rumphii* Bl.	Kabaipipal, Bettaarli	Tree	It is useful in burning sensations, leucoderma, ulcers, leprosy, itching, biliousness and diseases of blood.
130	*Ficus* spp.	Bargad, Gular, Kabipipal, dhudah	Tree	Used as timber, edible and shows medicinal properties.
131	*Flacourtia indica* (Burm.f.) Merr.	Ramontchi, Batoko plum, Pilkhan, Kapitanah	Tree	The leaves and roots are used in herbal medicine for the treatment of snakebite. The bark is believed to be effective for arthritis. Most parts of the plant are used for cough, pneumonia, and bacterial throat infection.
132	*Fritillaria roylei* Hook.	Jagli Lahusan	Herb	Medicinal plant, used in the treatment of asthma and tuberculosis.
133	*Geranium wallichianum* D.Don ex Sw.	Laljari, Rantanjot	Herb	Decoction of the root mixed with the bark of *Prunus cerasoides*, is used in the treatment of peptic ulcers. It has been used as a cure for toothache and has been applied externally to the eyes.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
134	*Gmelina arborea* Roxb.	Gambhari	Tree	Used as timber and fuel wood. The wood is also used for packing, matches and plywood.
135	*Grevillea robusta* A.Cunn. ex R.Br.	Silver oak, Silk oak	Tree	Timber has been used in the manufacture of furniture, cabinetry, and fences.
136	*Grewia elastic* Royle.	Dhaman	Tree	Used as timber, fuel, fodder and fibre.
137	*Grewia optiva* J.R. Drumm. ex Burret	Beul	Tree	Used as timber, fodder, fuel and fibre.
138	*Haldina cordifolia* (Roxb.) Ridsdale	Haldu , Kadami	Tree	Used to cure chronic cough and jaundice, stomachache and swelling in stomach, constipation and also useful in diarrhea and dysentery.
139	*Hedychium spicatum* Sm.	Ban haldi	Herb	It is a rhizomatous herb, used in medicines, food, cosmetics and perfumery industries.
140	*Heracleum candicans* Wall. ex DC.	Krandel, Chitra	Herb	It exhibit medicinal properties and used for the treatment of leucoderma.
141	*Heteropogon contortus* (L.) P. Beauv. ex Roem. & Schult.	Black speargrass, Tanglehead	Grass	Used as fodder and soil stabilizers.
142	*Hierochloe laxa* Hook.f.	Sweet grass	Grass	Used as fodder and soil conservation.
143	*Holarrhena antidysenterica* Wall.	Coral swirl	Shrub	Used to cure amoebic dysentery and chronic diarrhea.
144	*Holoptelea integrifolia* Planch.	Aavitholi, Aval , Cirabilva, Kanju, Indian elm	Tree	Cures inflammation, gastritis, dyspepsia, leprosy, colic, intestinal worms, vomiting, wound healing, diabetes, hemorrhoids, dysmenorrhea and rheumatism.
145	*Hyoscyamus niger* L.	Khursani ajwain, Parasikayavani	Herb	Cures ailments of the bones, rheumatism, nervous diseases, asthma, cough and stomach pain.
146	*Hypericum oblongifolium* Choisy	Chava, Chaya, Chitroi	Shrub	Cures antinociceptive, antidepressant, antiviral, antipyretic, antimicrobial, anti-inflammatory and healing properties.
147	*Indigofera heterantha* Brandis	Kathi, Sakina	Shrub	It is used as strong herbicides and insecticide; also as fuel and fooder.
148	*Jacaranda mimosifolia* D. Don	Blue Jacaranda, Neeli gulmohur	Tree	It is used to cure neuralgia and infection, also as ornamental.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
149	*Juglans regia* L.	Walnut, Akhrot	Tree	The leaves are alterative, antihelminthic, anti-inflammatory, astringent and depurative. It cures chronic coughs, constipation, asthma, diarrhoea, dyspepsia, etc.
150	*Justicia adhatoda* L.	Adusa, Basuti, Vasa	Shrub	It is used to cure cough, colds, asthma, bronchial catarrhea, liquefy sputum, bronchodilator, bronchitis and tuberculosis.
151	*Kigelia pinnata* (Jacq.) DC.	Sausage tree, Balam khira	Tree	Plant is antileprotic, anticancerous, antimalarial, antibacterial, analgesic and anti-inflammatory, antidiarrhoeal, antiurolithiasis, antioxidant, antidiabetic, etc.
152	*Koeleria* spp.	Grass	Grass	Fodder, astringent and apllied externally to the skin in the form of poultice to heal the wounds.
153	*Lemna* spp.	Common duckweed	Herb	Used in the treatment of colds, oedema, measles and difficulty in urination.
154	*Litsea chinensis* Lam.		Tree	Used as oil and fuel.
155	*Lonicera quinquelocularis* Hard.	Taknoi	Shrub	Used as fuel, fodder, walking stick and fruits edible.
156	*Lyonia ovalifolia* (Wall.) Drude	Ayar	Tree	The young leaves and buds are toxic, but they are used externally as an infusion to treat skin diseases and external parasites, and asloas piscicidal pland.
157	*Maesa indica* (Roxb.) A. DC.	Wild berry, Sesu, Machpora	Shrub	It has significant nutritional, radical scavenging, antioxidant and anti-diabetic properties; edible and fodder.
158	*Mallotus philippinensis* Muell.Arg	Kameela, Kampilla	Tree	Used as fodder, fuel, dye, and shows some medicinal properties.
159	*Melia composita* Benth.	Malabar neem	Tree	Used as timber and its various parts have antimalarial, antihelminthic, cathartic, emetic, and emmenagogic properties, and are also used to treat skin diseases.
160	*Moringa oleifera* Lam.	Drumstick tree, Senjana	Tree	Moringa is used for the treatment of diabetes, asthma, obesity, symptoms of menopause and many other conditions.
161	*Morus alba* L.	White mulberry, Shahtoot	Tree	Fruits are edible and also used as fodder, fuel wood, timber and fiber.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
162	*Murraya koenigii* (L.) Spreng.	Curry leaves	Shrub	Used in treating itching, piles, dysentery, inflammation, fresh cuts, bruises, and edema. The roots are purgative to some extent. They are stimulating and used for common body aches.
163	*Murraya paniculata* (L.) Jack	Jasmine orange	Shrub	Used as remedy for rheumatism, hysteria and coughs.
164	*Murraya* spp.	Curry leaves	Shrub	Used as remedy for rheumatism, hysteria and coughs.
165	*Myrica esculenta* Buch-Ham. ex D.Don	Bay berry, Kaphal	Tree	Fruits are edible. It is used as fuel and medicine to treat several ailments such as chronic bronchitis, asthma, cough, fever, ulcers, inflammation, anemia, diarrhea and ear, nose and throat disorders.
166	*Myrsine africana* L.	Chapra, Vidanga	Shrub	Used as laxative and antihelminthic, especially for curing infection of tape worm.
167	*Nelumbo* spp.	Lotus, Kamal, Padma	Herb	Consumed as copper rich vegetable. The ample amount of potassium helps to reduce heart problems, fatigue, high blood pressure and irritability.
168	*Neolitsea pallens* (D.Don) Momiy. & H.Hara	Kaalu	Tree	Used as antioxidant, antibacterial activity and also to cure infections and prevention of several diseases.
169	*Nerium indicum* Mill.	Kaner	shrub	It has medicinal properties such as bitter, acrid, antihelminthic, analgesic, adaptogenic, aphrodisiac anticancer:, anti-inflammatory: stomachic, febrifuge, diuretic astringent, emetic, expectorant, cardio tonic, anticancer, etc.
170	*Nyctanthes arbor-tristis* Craib.	Night flowering jasmine, Parijat	Shrub	Used in various ailments like fever, enlargement of the spleen, blood dysentery, malaria, cough and gastritis. Juice of leaves is used as digestives and antidote to reptiles venome.
171	*Olea ferruginea* Wall. ex Aitch.	Wild olive, Brown olive	Tree	Used as medicinal, fodder and oil.
172	*Oroxylum indicum* (L.) Kurz	Indian Trumpet flower, Bhut-vriksha	Tree	The root is used as anti-inflammatory, astringent, aphrodisiac, expectorant, antihelminthic and tonic. The bark is diuretic and stomachic and useful in diarrhoea and dysentery.
173	*Panicum maximum* L.	Buffalo grass	Grass	Used as soil stabilizer and fodder.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
174	*Phleum pratense* L.	Timothy grass, Common cat's tail grass	Grass	Used to reduce symptoms of hay fever.
175	*Phragmites karka* (Retz.) Trin. ex Steud.	Narkul, Doka –ghas	Grass	Used as soil stabilizer and fodder.
176	*Phragmites* spp.	Doka –ghas	Grass	Used as soil stabilizer and fodder.
177	*Phyllanthus emblica* (Retz.) Trin. ex Steud.	Amla, Anwala, Aonla,Amalaki,	Tree	Fruits are edible and also used as fodder, fuel and shows many medicinal properties.
178	*Phytolacca acinosa* Roxb.	Indian pokeweed	Herb	It is an edible and also used in the treatment of urinary disorders, oedema, nephritis, and abdominal distension.
179	*Picea smithiana* (Wall.) Boiss.	Rai	Tree	Used in construction, shingles, crates, household purposes etc. It is also used in the pulp industry to make paper. An indifferent fuel but it yields a fairly good charcoal.
180	*Picrorhiza kurroa* Royle ex Benth.	Karoo	Herb	It exhibit medicinal properties (hepato - protective, antipyretic and to treat dyspepsia, respiratory disorders,chronic diarrhea, and scorpion sting)
181	*Pinus gerardiana* Wall. ex D. Don	Chilgoza, Neoja, Nikocaka	Tree	Used as timber, fuel and have antiviral, antibacterial, antifungal, antihypertensive, antiseptic, expectorant and diuretic properties
182	*Pinus roxburghii* Sarg.	Kail	Tree timber	Used as fuel, timber and resin. The wood is antihelminthic, aromatic, haemostatic, stimulant, digestive, liver tonic, diaphoretic and diuretic.
183	*Pinus wallichiana* A.B. Jacks.	Kail	Tree	Used as timber and fuel. It is beneficial treatment for a variety of skin complaints, wounds, sores, burns, boils, etc. and also used in the form of liniment plasters, poultices, herbal steam baths and inhalers. The wood is diaphoretic and stimulant.
184	*Pistacia integerrima* J. L. Stewart ex Brandis	Kakarsinghi, Karkatasrngi	Tree	The leaf galls are used in traditional herbalism for asthma, cough, fever, vomiting and diarrhea.
185	*Poa alpina* L.	Grass	Grass	Used as fodder and soil stabilizer.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
186	*Poa annua* L.	Blue grass	Grass	Used as fodder and lawn grass.
187	*Poa pratensis* L.	Blue grass	Grasses	Used as fodder and in golf grounds.
188	*Polyalthia longifolia* (Sonn.) Thwaites	Ashok, Mast tree	Tree	The bark and leaves of this plant show effective cytotoxic function, antimicrobial, antiulcer and hypoglycemic activities and hypotensive effect.
189	*Polygonatum cirrhifolium* (Wall.) Royle	Medha, Coiling leaf	Herb	Used in the treatment of pain in the kidneys and hips, loss of vigour, swelling and accumulation of fluids in bone joints, fullness in the abdominal region, skin eruptions and coughs.
190	*Polygonatum multiflorum* (L.) All.	Solomon's seal	Herb	It is used in the treatment of stomach inflammations, chronic dysentery, etc. Root is astringent, demulcent, emetic and tonic.
191	*Polygonatum verticillatum* (L.) All.	Khinraula, Shirkakoli	Herb	Used to cure various health troubles as antiperiodic, cardiotonic, demulcent, aphrodisiac, diuretic, energizer, sedative, hypoglycemic, antitumor, general tonic, pain reliever, nervine tonic etc.
192	*Pongamia pinnata* (L.) Pierre	Pongam tree, Karanj	Tree	As crude drug used for the treatment of tumors, piles, skin diseases, and ulcers. The root is effective for treating gonorrhea, cleaning gums, teeth, and ulcers, and is used in vaginal and skin diseases.
193	*Populus deltoids* Marshall	Populus, Poplar	Tree	Used as timber, fuel wood as well as in paper and packaging industry.
194	*Prinsepia utilis* Royle	Bhekhal, Bhekoi	Shrub	Used as a treatment for rheumatism and muscular pain caused by hard work. The oil is also applied to the forehead and temples in the treatment of coughs and colds. The heated oilcake is applied as a poultice to the abdomen in the treatment of stomachaches.
195	*Prunus armeniaca* L.	Chuli	Tree	Decoction used to soothe inflame skin and irritated skin condition, seed is analgesic and antihelminthic, treatment of asthma cough , crinic bronchitis.
196	*Prunus ceracifera* Ehrh.	Cherry plum	Tree	Used as an ornamental plant, edible fruit and used as rootstock in grafting.
197	*Prunus cerasoides* Buch. Ham. ex D. Don	Pajja	Tree	Used as fodder, fuel wood, analgesic, antiabortifacient. It is useful in stomach trouble, common cold and cough.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
198	*Prunus cornuta* (Wall. ex Royle) Steud.	Jamoi	Tree	Used as edible, fuel and fodder.
199	*Prunus domestica* L.	-	Tree	Fruits edible.
200	*Prunus persica (*L.) Batch	Aadu	Tree	Fruits edible, kernel paste is applied on forehead for headache, twigs used as toothbrush, fodder.
201	*Psidium guajava* L.	Amrood	Tree	Fruits edible.
202	*Pterocarpus marsupium* Roxb.	Indian Kino tree, Beeja patta, Malabar kino tree	Tree	Used in the treatment of hemorrhages, fractures, constipation, skin diseases, ophthalmology, depurative, leprosy, rectalgia and leucoderma, rheumatoid arthritis, skin diseases, external use for sores, boils, stomach pain and gastrointestinal disorders.
203	*Punica granatum* L.	Anar	Tree	Used in the treatment of Cancer, Osteoarthritis and Other Diseases. The pomegranate has been used in natural and holistic medicine to treat sore throats, coughs, urinary infections, digestive disorders, skin disorders, arthritis and to expel tapeworms.
204	*Pyrus pashia* Buch.-Ham.ex D.Don	Kainth, Indian wild pear	Tree	It is used to cure gastrointestinal disorders, fever, headache, hysteria, epilepsy and sweating of body (diaphoretic). The fruits of this plant are sedative, febrifuge and laxative.
205	*Quercus floribunda* Lindl. ex A.Camus	Moru	Tree	Used as timber, fuel and fodder.
206	*Quercus ilex* L.	Holly oak	Shrub	The tree's wood is hard and only used for smaller woodcrafts, such as handles and carpentry tools.
207	*Quercus oblongata* D.Don	Ban oak	Tree	It is variably used in treating wide range of diseases such as diarrhea, stomachache, urinary infection, toothache, piles, astringent, gonorrhea, asthma, dysentery and stomach pain.
208	*Quercus semecarpifolia* Sm.	Kharsu	Tree	Used as fodder and fuel.
209	*Rheum moorcroftianum* Royle	Revand chini, Amalparni	Herb	It is commonly used for the treatment of renal function disorder, hyperlipidemia, cancer and improves the memory in senile patients.
210	*Ricinus communis* L.	Castor bean	Shrub	Leaf, root and seed oil are used in hypoglycemic, liver disorders, inflammation treatment and as a laxative.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
211	*Rosa moschata* Herrm.	Kunja, Kujoi	Shrub	It is rich in anti- oxidants and used for the treatment of abdominal spasm and diarrhea.
212	*Rosa* spp.	Kunai, kujoi, Gulab	Shrub	It is used as an ornamental plant.
213	*Rubus biflorus* Buch.- Ham. ex Sm.	Blackberries	Shrub	Root extract is a catharctic and emetic in nature. Fruits are edible.
214	*Rubus ellipticus* Sm.	Golden Himalayan raspberry	Shrub	Fruits are edible and have medicinal properties.
215	*Rubus niveus* Thunb.	Hill raspberry, huftoo, Kale hinure	Shrub	Fruit are edible and used as an ornamental due to the striking red-purple colour of its stems.
216	*Rubus* spp.	Heenr	Shrub	Fruit are edible and used as an ornamental due to the striking red-purple colour of its stems.
217	*Saccharum spontaneum* L.	Wild sugar cane, Kans grass	Grass	Roots are sweet, astringent, emollient, refrigerant, diuretic, lithotriptic, purgative, tonic, aphrodisiac and useful in treatment of dyspepsia, burning sensation, piles, sexual weakness, gynecological troubles, respiratory troubles, etc. Planted to check soil-erosion.
218	*Salix alba* L.	Indian willow	Tree	It is used to cure cold, fevers and joint pains.
219	*Salix babylonica*	willow	Tree	Used as timber, fodder and fuel.
220	*Salix* spp.	willow	Tree	Used as timber, fodder and fuel.
221	*Santalum album* L.	Indian Sandalwood, Sandal	Tree	To cure common colds, bronchitis, skin disorders, heart ailments, general weakness, fever, infection of the urinary tract, inflammation of the mouth and pharynx, liver and gallbladder complaints and other maladies.
222	*Sapindus mukorossi* Gaertn.	Soapberry, reetha	Tree	Used for cleansing and pharmacological.
223	*Saraca asoca* (Roxb.) Willd.	Sita Ashoka tree	Tree	Used in the treatment of internal bleeding, infertility, hemorrhoids and insomnia. It can rejuvenate the complexion, reduce freckles and calm down inflammation.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
224	*Sarcococca saligna* Mull.- Arg.	Geru, Willow leaf sweet box	Shrub	Leaves are laxative and used as blood purifier and muscular analgesic. The aqueous-methanolic extract of *S. saligna* has saponins, flavonoids, tannins, phenols, and alkaloids which have calcium channel blocking activity.
225	*Saussurea costus* (Falc.) Lipsch.	Kuth, uplet, Rauta	Herb	Costus oil is used for asthma, cough, gas, and severe intestinal diseases such as dysentery and cholera.
226	*Scirpus grossus* L.f.	Kaseru, rush or Bulrush	Herb	Used to cure nausea, diarrhea, thirst, scanty micturition, jaundice, improving the sperm count and weakness of the cardiac muscles.
227	*Selinum tenuifolium* Salisb.	Bhootkeshi	Herb	The fruits have sedative and aphrodisiac properties and are also used to treat rheumatism and kidney disease.
228	*Selinum vaginatum* C. B. Clark	Bhootkeshi	Herb	The fruits have sedative and aphrodisiac properties and are also used to treat anxiety, painful condition, vaat an cough rog.
229	*Setaria glauca* (L.) P.Beauv.	Wild foxtail millet	Grass	It is edible and used as fodder.
230	*Sinopodophyllum hexandrum* (Royle.) T.S.Ying	Bankakri,Vanatrapusi	Herb	Used for the treatment of cancer, ulcers, cuts and wounds.
231	*Sphaeralcea munroana* (Douglas ex Lindl.) Spach ex A.Gray	Munro's globemallow	Herb	Used in sore throats and irritation along the digestive track.
232	*Spiraea canescens* D.Don	Jhar Mairala	Shrub	Fodder for goats and twigs used in providing strength to baskets and Kiltas.
233	*Spiraea* spp.	Jhar mairala, Double bridal wreath	Shrub	Plants are ornamental and used as asprin.
234	*Spirodela polyrrhiza* (L.) Schleid.	Common duckweed	Aquatic	It is rich in protein and used as fodder.
235	*Sporobolus diander* (Retz.) P.Beauv.		Grass	Used as fodder and soil conservation.
236	*Stipa roylei* (Nees) Duthie	Needle grass	Grass	The bulb is antirheumatic, antiasthmatic, febrifuge, oxytoxic, ophthalmic and galactogogue.
237	*Swertia angustifolia* Buch. Ham. ex D. Don	Chirayta	Herb	Used to treat liver disorder, malaria, diabetes and in farmocological activities

Sl No	Botanical Name	Common Name	Habit	Special Attributes
238	*Swertia cordata* Wall. ex G. Don	Heart leaf	Herb	Used against gastroenterological disorder, high blood sugar.
239	*Swertia paniculata* Wall. D. Don	Chirayta	Herb	Decoction taken as tonic and treatment of malaria.
240	*Syringa emodi* Wall. ex Royle	Himalayan lilac	Shrub	It is used as fuel and also used in traditional medicines.
241	*Syzygium cumini* (L.) Skeels	Jamun, Naaval, Jambu	Tree	Fruits are edible and also shows medicinal properties.
242	*Syzygium venosum* DC.	Jamun	Tree	Astringent to bowels treatment of sorethroat, dysentery and ulcers.
243	*Taxus wallichiana* Zucc.	Thuner	Tree	Used to cure cough, common cold, fever and pain.
244	*Tecoma stans* (L.) Juss. ex Kunth	Yellow trumpet bush, Pilia	Shrub	Used as fuel wood, for making charcoal and curing diabeties and cyphilis.
245	*Tecomella undulata* (Sm.) Seem.	Roheda , Honey tree, Rohida	Tree	Bark of stem is used as a remedy for syphilis. It is also used to cure enlargement of spleen, urinary disorders, gonorrhoea, leucoderma and liver diseases. Seeds are used against abscess.
246	*Tectona grandis* L.f.	Teak, Sagun	Tree	The wood is considered as a laxative, sedative for the uterus, good for piles, leucoderma and dysentery and timber.
247	*Tephrosia hamiltonii* Gamble	Sarphonka, Ban- nil	Herb	Plant is alexiteric, antithelminthic, restorative and antipyretic.
248	*Terminalia arjuna* (Roxb. Ex DC) Wight Avn	Arjun	Tree	Tassar cultivation, timber, fencing, fuel wood, medicinal (heart tonic).
249	*Terminalia bellirica* (Gaerth.)Roxb.	Bahera	Tree	Used as fodder, fuel, fruit (myrobalan), timber, medicicinal, ingredient of 'triphala'.
250	*Terminalia chebula* Retz.	Harar	Tree	Used as fodder, fuel, fruit (myrobalan), timber, medicicinal, ingredient of 'triphala'.
251	*Terminalia* spp.	Harar, Bahera	Tree	Plant is edible, used as fodder and fuel and also used in traditional medicine to treat bacterial infectious diseases including diarrhea, dysentery, pneumonia, and sore throats.
252	*Thamnocalamus spathiflorus* (Trin.) Munro		Grass	Used as fuel and fodder.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
253	*Themeda anathera* (Nees ex Steud.) Hack.	Loonder grass	Grass	Plant is used to produce fodder for livestock and for thatching.
254	*Themeda arundinacea* Roxb.	A. Camus	Grass	Used as sourse of fiber and thaching material
255	*Thuja orientalis* L. Biota	Oriental thuja	Tree	Used to cure respiratory track infection, bacterial skin infection, cold sores and nerve disorders.
256	*Thymus linearis* Benth.	Himlayan thyme, Jangli ajwain	Herb	Plant is edible and also has medicinal properties. It is used externally as an antiseptic, to treat wounds, to combat eczema , or to reduce swelling.
257	*Thysanolaena maxima* (Roxb.) Kuntze	Naktura, Nastura	Grass	Plant is used as soil stabilizer. Leaves and the tips are used as fodder; the bushy and fox-tail-like panicles are used for making brooms.
258	*Tinospora cordifolia* (Willd.) Miers.	Giloy, amrithaballi, Seendhil. Gulje, Galo, Guduci	Climber	Plant is used as fodder and it is used for high cholesterol, diabetes, upset stomach, allergic rhinitis (hay fever), gout, lymphoma and other cancers, rheumatoid arthritis (RA), hepatitis, peptic ulcer disease (PUD), fever, gonorrhea, syphilis, and to boost the immune system.
259	*Toona ciliata* M.Roem.	Toon	Tree	Used as timber. The bark may be used for tanning leather, and has been traditionally used to make twine and string bags. Its bark is used as an astringent and tonic and to treat dysentery and to heal wounds.
260	*Trifolium repens*	Dutch clover	Herb	Antirheumatic, tonic, fodder and soil conservation.
261	*Trifolium pratense* L.	Red clover	Grass	Used as fodder and in traditional medicine of India as antispasmodic, sedative, deobstruent, expectorant, anti-inflammatory and antidermatosis agent.
262	*Trillium govanianum* Wall. ex D. Don	Nag chhatri, Satva	Herb	It has medicinal properties and used to cure dysentery, wound healing, menstrual and sexual disorders.
263	*Typha* sp.	Vileurnum	Shrub	Muscle relaxant to relieve cramps asthma and hypertention.
264	*Ulmus wallichiana* Planch.	Emroi, Imroi	Tree	Plant is used as fodder, fuel and timber. A strong fibre is obtained from the inner bark and used for cordage, slow matches and sandals.

Sl No	Botanical Name	Common Name	Habit	Special Attributes
265	*Viburnum* spp.		Shrub	Plant is used as fodder and fuel.
266	*Viburnum cotinifolium* D. Don	Talanj	Shrub	Plant is used as fodder, fuel and it is edible. It is used to treat menstrual pain, morning sickness and cramps of the digestive tract or the bile ducts. Black haw's primary use was to prevent miscarriages.
267	*Valeriana jatamansi* Jones	Balchhari, Mushkbala	Herb	Plant is well-known in traditional Indian medicine. It is used to cure diseases of eye, blood and livers, remedy for hysteria, hypochondriasis, nervous unrest and emotional stress. Also useful in clearing voice and acts as stimulant in advance stage of fever and nervous disorder.
268	*Viburnum grandiflorum* Wall. ex DC.	Talanj	Shrub	The plant has laxative properties. It is also used as fuel and fodder.
269	*Viola canescens* Wall. ex Ging.	Banafasha	Shrub	The plant has diaphoretic and antipyretic properties. In inflorescence are used to treat sore throat, cough, kidney diseases and disorder in liver.
270	*Vitex negundo* L.	Nirgundi	Shrub	The plant is very good soil binder. It cures joint pain and muscle aches. It is also used for curing skin diseases and also used as fuel wood.
271	*Woodfordia fruiticosa* (L.) Kurz	Dhaula	Shrub	It is used as fuel and fodder. It is also used in the treatment of piles, diarrhea and dysentery.
272	*Zanthoxylum armatum* DC.	Tejbal, Timru,Tumburu, Tejovati	Shrub	The fruits are edible and it is used to cure bronchitis, asthma, varicose veins and diarrhea.
273	*Ziziphus jujuba* Mill.	Ber, beri, Jhar beri	Shrub	The fruits are edible and it is used as a fuel wood. It cures liver ailment and bladder diseases and constipation. The leaves can be used as fodder.
274	*Ziziphus nummularia* (Burm.f.) Wt. & Arn.	Ber, Beri	Shrub	The fruits are edible and it is used as a fuel wood. The leaves can be used as fodder.
275	*Ziziphus* spp.	Ber, Beri, jhar beri	Shrub/ tree	The fruits are edible and it is used as a fuel wood. The leaves can be used as fodder.

Annexure–5: Model-Wise-List of suggestive plant species for Planting in Natural, Agriculture and Urban Landscapes

Botanical Name	Natural Landscape																									Agriculture Landscape						Urban Landscape									
	RV/HP/NL													RV/JK/NL											RV/ PB/ NL		Hills (HP/J&K /AL)				Plain(PB/AL)		Hills (HP/J&K/UL)						Plains (PB/UL)			
	1	2	3	4	5	6	7	8	9	10	11	12	13	1	2	3	4	5	6	7	8	9	10	11	12	1	2	1	2	1	2	1	2	1	2	3	1	2	3	1	2	3	4
Senegalia catechu (L.F.) Willd.									.	.	.								.	.	.	.	.			.																
***Acacia nilotica* (l.) Dilile.**																										.	.								.				.			.	
***Acer acuminatum* Wall. Ex D. Don**		.																																								
***Acer caesium* Wall. Ex Brandis**				.											.																											
***Acer pictum* Thumb.**						.																																				
***Acer* spp.**																	.																										

***Achillea millefolium* L.**																.	.																													
***Aconitum heterophyllum* Wall. Ex Royle**		.	.	.	.									.	.	.	.																												
***Aconitum violaceum* Jacquem. ex Stapf**	.													.																															
***Aegle marmelosa* (L.) Correa**							.	.	.	.	.									.	.	.	.	.					.	.	.	.												
***Agropyron* spp.**	.					.	.	.	.					.				.		.	.																								
***Agrostis gigantean* Roth.**	.						.	.	.					.					.	.	.																								
***Agrostis munroana* Aithc. & Hemsl.**	.													.																															
***Agrostis pilosula* Trin.**	.													.																															
***Ailanthus excelsa* Roxb**.																											.	.																	
***Ainsliaea aptera* DC.**	.													.																															
***Ajuga* spp.**					.												.																											

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***Bambusa bambos* (L.) Voss**									.																																			
***Bambusa* spp.**										.	.										.	.	.																					
***Bauhinia variegata* L.**							.	.	.	.	.									.	.	.	.	.																				
***Berberis lycium* Royle**																				.	.																							
***Berberis* spp.**					.			.									.												.														
***Bergenia ciliata* (Haw.) Sternb.**				.	.											.	.																										
***Bergenia stracheyi* (Hook. f. & Thomson)**		.													.																												
***Betula alnoides* Buch.-Ham. ex D. Don**						.											.																										
***Betula utilis* D. Don**		.													.																												
***Boerhavia diffusa* L.**							.	.	.	.	.									.	.	.	.	.																				
***Bombax ceiba* L.**							.		.											.	.		.	.			.																	

***Bothriochloa intermedia* (R. Br.) A. Camus**							.	.	.										.	.	.																								
***Bothriochloa parviflora* (R. Br.) Ohwi**						.												.																											
***Bothriochloa pertusa* (L.) A. Camus**						.	.	.	.										.	.		.	.																						
***Bougainvillea* spp.**																										.							.			.	.		.		.		.		
***Brachypodium sylvaticum* (Huds.) P. Beauv.**	.													.																															
***Bromus himalaicus* Stapf**	.													.																															
***Bromus ramosus* Huds.**														.																															
***Butea monosperma* (Lam.) Taub.**																										.							.			.	.		.		.		.		
***Calamagrostis montanensis* (Scribn.) Scribn. ex Vasey**	.					.																																							

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***Chrysopogon gryllus* (L.) Trin.**						.												.																									
***Chrysopogon serrulatus* Trin.**							.	.	.										.	.	.																						
***Cinnamomum tamala* (Buch.-Ham.) T. Nees & Eberm.**							.	.	.										.	.	.																						
***Citrus limon* (L.) Osbeck**																										.																
***Cordia myxa* L.**																									.																	
***Cornus capitata* Wall.**					.																																				
***Cornus macrophylla* Wall.**						.											.																								
***Cornus oblonga* Wall.**				.												.																									
***Corylus jacquemontii* Decne.**		.													.																										
***Cotoneaster bacillaris* Wall. Ex Lindl.**				.	.											.	.																								

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***Daphne papyracea* Wall. ex G. Don**				.	.											.																												
***Daphne* spp.**															.																													
***Debregeasia hypoleuca* (Hochst. ex A. Rich.) Wedd.**				.	.			.	.							.	.			.	.																							
***Delphinium cashmerianum* Royle**														.																														
***Dendrocalamus hamiltonii* Nees & Arn. ex Munro**																			.																									
***Dendrocalamus* spp.**									.	.											.	.	.																				
***Dendrocalamus strictus* (Roxb.) Nees**							.	.	.		.									.	.	.	.																				
***Deschampsia* spp.**										.	.											.	.																				
***Desmodium elegans* DC.**				.												.	.																										
***Desmodium gangeticum* (L.) DC.**									.												.																							
Deutzia corymbosa					.			.	.												.																						

R.Br. ex G. Don																																													
***Deutzia* spp.**																.																													
***Deutzia staminea* R. Br. ex Wall.**					.			.	.										.	.																								
***Dichanthium annulatum* (Forssk.) Stapf**																					.	.																							
***Diospyros edulis* Lodd. ex Sweet**																												.	.																
***Diospyros kaki* L.f.**																												.	.																
***Diospyros lotus* L.**																												.	.																
***Diospyros montana* B. Heyne ex A.DC.**							.	.	.	.	.																																		
***Diospyros* spp.**																			.		.	.	.																						
***Drepanostachyum falcatum* (Nees) Keng f.**			.	.	.											.	.											.																
***Eichhornia* spp.**																																													
***Elaeagnus conferta* Roxb.**					.				.							.			.																										

***Eragrostis nigra* Nees ex Steud.**										.	.											.	.																						
***Erianthus filifolius* ex Steud.**							.	.	.											.	.	.																							
***Erianthus rufipilus* Griseb.**							.	.	.											.	.	.																							
***Erianthus* spp.**	.					.								.				.																											
***Eriobotrya japonica* (Thunb.) Lindl**																											.																		
***Eucalyptus camaldulensis* Dehnh.**																																													
***Eucalyptus* spp.**																																													
***Eucalyptus tereticornis* Sm.**																																													
Eulaliopsis binata (Retz.) C.E.Hubb.																				.	.	.	.	.																					
***Euonymus* spp.**																																													
***Festuca arundinacea* Schreb.**							.	.												.	.	.																							

***Festuca pratensis* Huds.**	.					.	.	.	.					.				.	.	.	.																								
***Festuca valesiaca* Schleich. Ex Gaudin**	.													.																																
***Ficus* spp.**																																														.	
***Ficus racemosa* L.**							.																																							
***Ficus rumphii* Bl.**							.																																					.	.		
***Ficus benghalensis* L.**							.																																							
***Ficus racemosa* L.**																												.																		
***Ficus* spp.**								.	.										.	.	.	.	.																						
***Flacourtia indica* (Burm. f.) Merr.**							.	.																																						
***Fritillaria roylei* Hook.**	.	.												.	.																															
***Geranium wallichianum* D. Don ex Sw.**	.	.	.	.	.									.	.	.	.																													
***Gmelina arborea* Roxb.**																															.	.	.	.											

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***Lonicera quinqueloculari s* Hard**				.																																						
***Lyonia ovalifoli a* (Wall.) Drude)**					.		.	.								.		.	.																							
***Maesa indica* (Roxb.) A.DC.**							.	.	.									.	.	.					.																	
***Mallotus philippinensis* Muell. Arg**							.	.		.		.						.	.		.	.																				
***Mangifera indica* L.**																										.																
***Melia composite* Benth.**																									.	.			.	.	.	.					.				.	
***Moringa oleifera* Lam.**																									.																	
***Morus alba* L.**																									.																.	
***Murraya koenigii* (L.) Spreng.**																		.																								
***Murraya paniculata* (L.) Jack.**																		.																								
***Myrica esculenta* Buch-Ham. ex D. Don**						.																					.	.													
Myrsine							.		.									.	.																						

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***Spiraea canescens* D. Don**					.												.																													
***Spiraea* spp.**																											.								.				.	.		.		.		.
***Spirodela polyrrhiza* (L.) Schleid.**																																										.				
***Sporobolus dianderus* (Retz.) P. Beauv.**																																														
***Stipa roylei* (Nees) Duthie**	.													.																																
***Swertia angustifolia Buch.*-Ham. ex D. Don**																	.																													
***Swertia caudata* Wall. ex G. Don) C. B. Clarke**																	.																													
***Swertia paniculata* Wall.**																	.																													
***Syringa emodi* Wall. ex Royle**				.												.																														
***Syzygium cumini* (L.)**								.	.	.		.									.	.	.	.																					

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Annexure – 6: Model-Wise/Activity-Wise List of Forest divisions for forestry interventions of Ravi Riverscape

State	Landscape	Model/Activity	Area (ha)	Cost (Rs. in Crore)
Himachal Pradesh	Natural	RV/HP/NL/01- Sub-Alpine Conservation	-	-
		RV/HP/NL/02- Sub Alpine Enrichment	-	-
		RV/HP/NL/03- Temperate Conifer Forest	513	15.5943
		RV/HP/NL/04- Temperate Mixed Forest	1283	39.0985
		RV/HP/NL/05- Pasture and Grazing Land Development	100	2.2755
		RV/HP/NL/06- Himalayan Chir Pine Forest	351	10.6513
		RV/HP/NL/07- Himalayan Mixed Forest	54	1.4739
		RV/HP/NL/08- Sub Tropical Dry Deciduous Forest	59	1.5831
		RV/HP/NL/09- Eradication of Lantana (> 50%)	-	-
		RV/HP/NL/10- Control/ Removal of Invasive Species or <50% Lantana	-	-
		RV/HP/NL/11- Protection Model for Natural Regeneration	720	12.9042
		RV/HP/NL/12- Fire Protection Model	185	2.3851
		RV/HP/NL/13- Eco-Task Force Model	1000	41.27
	Agriculture	RV/HP/AL/01 - Boundary Plantation Model	175	0.4282
		RV/HP/AL/02 –Planting of Economic Trees in Block Plantation	29	0.3782
	Urban	RV/HP/ UL/01 - Riverfront Development	2	4.95
		RV/HP/ UL/02 -Institutional and Industrial Plantation	104	4.4616
		RV /HP/UL /03 -Eco-park Development	7.2	17.82
	Conservation Interventions	**Soil and water Conservation**	**(m3)**	
		RV/HP/CI/01-Broushwood Intervention	14830	0.4449

		RV/HP/CI/02-Dry Stone Activities	132933	23.92
		RV/HP/CI/03-Create wire Activities	58817.5	26.46
		RV/HP/CI/04-Water Pond	39620	1.38
		RV/HP/CI/05- Silt Detention Dam Type Activities	1630	0.978
	Other Interventions	**Other Interventions**	**Area (ha)**	
		RV/HP/CI/06-Riparian Wildlife Management	235	23.50
		RV/HP/CI/07-Wetland Management (Natural and Artificial)	53	4.77
		Sub Total =	**4870.20 ha. + 247830.5**	**236.72**
J&K UT	Natural	RV/JK/NL/01- Sub-Alpine Conservation	-	-
		RV/JK/NL/02- Sub Alpine Enrichment	-	-
		RV/JK/NL/03- Temperate Conifer Forest	11	0.3196
		RV/JK/NL/04- Temperate Mixed Forest	-	-
		RV/JK/NL/05- Pasture and Grazing Land Development	-	-
		RV/JK/NL/06- Himalayan Chir Pine Forest	38	0.9786
		RV/JK/NL/07- Himalayan Mixed Forest	-	-
		RV/JK/NL/08- Sub Tropical Dry Deciduous Forest	120	3.2359
		RV/JK/NL/09- Eradication of Lantana (> 50%)	46	1.0211
		RV/JK/NL/10-Control/ Removal of Invasive Species or <50% Lantana	15	0.3603
		RV/JK/NL/11- Protection Model for Natural Regeneration	310	4.7198
		RV/JK/NL/12-Fire Protection Model	190	1.1748
		RV/JK/NL/13- Eco-Task Force Model	1000	42.35
	Agriculture	RV/JK/AL/01 -Planting of Economic Trees	207	0.5217
		RV/JK/AL/02 –Planting of Economic Trees in Block Plantation	38	0.4955
	Urban	RV/JK/ UL/01 - Riverfront Development	-	-
		RV/JK/ UL/02 - Institutional and Industrial Estate Plantation	121	5.1909

		RV /JK/UL /03 -Eco-park Development	5.59	12.6225
	Conservation Interventions	**Soil and water Conservation**	**(m3)**	
		RV/JK/CI/01-Broushwood Intervention	-	-
		RV/JK/CI/02-Dry Stone Activities	10810	1.9458
		RV/JK/CI/03-Create wire Activities	8780	3.951
		RV/JK/CI/04-Water Pond	-	-
		RV/JK/CI/05- Silt Detention Dam Type Activities	-	-
	Other Interventions	**Other Interventions**	**Area (ha)**	
		RV/JK/CI/06-Riparian Wildlife Management	20	2.00
		RV/JK/CI/07-Wetland Management (Natural and Artificial)	-	-
		Sub Total =	**2121.59 ha. + 19590.00m^3**	**80.908**
Punjab	Natural	RV/PB/NL/01- Restoration of Degraded Forests Model	561.35	13.0185
		RV/PB/NL/02- Road Side Plantation	234	10.5217
	Agriculture	RV/PB/AL/01 -Boundary Plantation Model	700	1.766
		RV/PB/AL/02 – Block Plantation Model	118	1.5408
	Urban	RV/PB/ UL/01–Bioremediation and Biofiltration	9.1	2.2524
		RV/PB/ UL/02 - Riverfront Development	2.7	6.6825
		RV/PB/ UL/03 - Institutional and Industrial Estate Plantation	88	3.9897
		RV /PB/UL /04 -Eco-park Development	4.6	11.385
	Conservation Interventions	**Soil and water Conservation**	**(m3)**	
		RV/PB/CI/01-Broushwood Intervention	24120	0.7236
		RV/PB/CI/02-Dry Stone Activities	43580	7.8444
		RV/PB/CI/03-Create wire Activities	3400	1.53
		RV/PB/CI/04-Water Pond	114400	4.004
		RV/PB/CI/05- Silt Detention Dam Type Activities	-	-
	Other Interventions	**Other Interventions**	**Area (ha)**	
		RV/PB/CI/06- Riparian Wildlife Management	57	5.70
		RV/PB/CI/07- Wetland Management (Natural and Artificial)	56	5.04
			1830.75 ha+185500m^3	**75.9987**
Grand Total =			**8822.54 ha +452920.5m^3**	**393.6267**

Annexure 7(a): Division Wise Projected Extent of Plantations in Natural Landscapes in Himachal Pradesh except for Protection of Forest Fire and Natural Regeneration in Himachal Pradesh (with sitename)

Sr. No.	Division	Site name	Year								Year				Phase II	Grand Total Phase I and Phase II Hac	
			Phase I						Phase I		Phase II						
			(Extent in ha)						Total(Extent in ha)		(Extent in ha)				Total (ha)		
			I	II	III	IV		V			VI	VII	VIII	IX			
			Est*	Est*	Est	Est	Maint	Est	Maint	Est	Maint	Maint	Maint	Maint	Maint	Maint	Est	Maint
1	Bharmour	Bagdu Ghar	8	8	8	0	8	0	8	8	8	8	8	0	0	8	8	8
		Chaled Ghar	9	9	9	0	9	0	9	9	9	9	9	0	0	9	9	9
		Dhuwan Nalla	9	9	9	0	9	0	9	9	9	9	9	0	0	9	9	9
2	Chamba	****Aate DPF	0	0	0	0	0	18	0	18	0	18	18	18	18	18	18	18
		Badath	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Bagga CA	0	0	0	0	0	18	0	18	0	18	18	18	18	18	18	18
		Baliani	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Bhadhor	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Bhadruni CA	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Bhala/ Sanoli DPF	7	0	7	0	7	0	7	7	7	7	7	0	0	7	7	7
		Brehi	12	0	12	0	12	0	12	12	12	12	12	0	0	12	12	12
		Challoga CA	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Chamla	9	0	9	0	9	0	9	9	9	9	9	0	0	9	9	9
		Chandruni Dhar	0	0	0	0	0	20	0	20	0	20	20	20	20	20	20	20
		Chau CA	0	0	0	0	0	10	0	10	0	10	10	10	10	10	10	10
		Choo	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Chubu Galla	7	0	7	0	7	0	7	7	7	7	7	0	0	7	7	7
		Chuhhani	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Daggi Ghar	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10

		Darkund	6	0	6	0	6	0	6	6	6	6	6	0	0	6	6	6
		Duari	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Fati CA	8	0	8	0	8	0	8	8	8	8	8	0	0	8	8	8
		Gaggal CA	8	0	8	0	8	0	8	8	8	8	8	0	0	8	8	8
		Gandri DPF	8	0	8	0	8	0	8	8	8	8	8	0	0	8	8	8
		Ghilli	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Ghudha Gudha	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Gohanana	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Guwadi DPF	9	0	9	0	9	0	9	9	9	9	9	0	0	9	9	9
		Jamela DPF	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Jangi CA	12	0	12	0	12	0	12	12	12	12	12	0	0	12	12	12
		Jhunas	0	0	0	0	0	5	0	5	0	5	5	5	5	5	5	5
		Kalandra Bathri	12	0	12	0	12	0	12	12	12	12	12	0	0	12	12	12
		Kalandra Bathri	0	0	0	0	0	12	0	12	0	12	12	12	12	12	12	12
		Kalandra Ca	0	0	0	0	0	12	0	12	0	12	12	12	12	12	12	12
		Kalwara	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Kamotha CA	2	0	2	0	2	0	2	2	2	2	2	0	0	2	2	2
		Karpok	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Kathwar DPF	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Khaddal	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Khorgoth CA	0	0	0	0	0	19	0	19	0	19	19	19	19	19	19	19
		Kiratot	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Kohal Kuthes C-A	3	0	3	0	3	0	3	3	3	3	3	0	0	3	3	3
		Kundlodine	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Kuthar DPF	3	0	3	0	3	0	3	3	3	3	3	0	0	3	3	3
		Lodhar	11	0	11	0	11	0	11	11	11	11	11	0	0	11	11	11
		Lothal	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Luna	8	0	8	0	8	0	8	8	8	8	8	0	0	8	8	8

		Mandola	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Manju	3	0	3	0	3	0	3	3	3	3	3	0	0	3	3	3
		Masrond Laddi-II	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Masrond Laddi-II	9	0	9	0	9	0	9	9	9	9	9	0	0	9	9	9
		Mehla Nala	8	0	8	0	8	0	8	8	8	8	8	0	0	8	8	8
		Moha DPF	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Nagooni C.A	7	0	7	0	7	0	7	7	7	7	7	0	0	7	7	7
		Padhri	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15
		Rupni D.P.F	8	0	8	0	8	0	8	8	8	8	8	0	0	8	8	8
		Ruvandi CA	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Sadoon CA	8	0	8	0	8	0	8	8	8	8	8	0	0	8	8	8
		Saklana	11	0	11	0	11	0	11	11	11	11	11	0	0	11	11	11
		Sapan	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Sarana	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Shiv Panihar	7	0	7	0	7	0	7	7	7	7	7	0	0	7	7	7
		Sulaha CA	12	0	12	0	12	0	12	12	12	12	12	0	0	12	12	12
		Sundri C.A	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Thalli D.P.F	2	0	2	0	2	0	2	2	2	2	2	0	0	2	2	2
		Tikrigarh DPF	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Tolai DPF	0	3	0	3	0	0	3	3	3	3	3	3	0	3	3	3
		Udai Nallah	9	0	9	0	9	0	9	9	9	9	9	0	0	9	9	9
		Uteep C.A	7	0	7	0	7	0	7	7	7	7	7	0	0	7	7	7
3	**Churah**	Ainthen Dhar Pasture Development	0	0	0	0	0	18	0	18	0	18	18	18	18	18	18	18
		Aoun Dhar Pasture Development	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Badhel / Bambeu	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Baggi DPF	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5

		Bhadsar CA	0	0	0	0	0	12	0	12	0	12	12	12	12	12	12	12
		Bhangaid CA	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Bhangwad C.A	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Bhatiyund Ghar 2021-22	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Bidha Pasture Development	0	15	0	15	0	0	15	15	15	15	15	15	0	15	15	15
		Butla 2nd	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Chabadh CA	0	12	0	12	0	0	12	12	12	12	12	12	0	12	12	12
		Chachul CA	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Chachul dhar pasture development	0	15	0	15	0	0	15	15	15	15	15	15	0	15	15	15
		Chamwas CA	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Chandi Mandralla Dhar	0	0	0	0	0	20	0	20	0	20	20	20	20	20	20	20
		Chanjali CA	0	0	0	0	0	12	0	12	0	12	12	12	12	12	12	12
		Chiugali CA	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Dadiyund CA	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Daloran	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Damtaal CA	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Dar	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Dehal Pasture Development	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15
		Dellu C.A	0	7	0	7	0	0	7	7	7	7	7	7	0	7	7	7
		Dhabbi-1st-C.A.	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Dhabbi-2nd-C.A.	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Dhaneli CA	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Dhar Chammed Pasture Development	0	0	0	0	0	50	0	50	0	50	50	50	50	50	50	50
		Dharopad C.A.	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5

		Dhel Top CA	0	8	0	8	0	0	8	8	8	8	8	8	0	8	8	8
		Dibhari CA	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15
		Dol Ghar	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Dudra	0	0	0	0	0	40	0	40	0	40	40	40	40	40	40	40
		Dumes C.A.	0	0	0	0	0	12	0	12	0	12	12	12	12	12	12	12
		Dunwad C.A	0	9	0	9	0	0	9	9	9	9	9	9	0	9	9	9
		Fangei CA	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Gagal C.A.	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Ganed	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Ghadetra Ghar Land Slide /Slips	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Googlotu C.A.	0	8	0	8	0	0	8	8	8	8	8	8	0	8	8	8
		Goongoth C.A.	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Goth C.A	0	0	0	0	0	11	0	11	0	11	11	11	11	11	11	11
		Grohan CA	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Guery	0	7	0	7	0	0	7	7	7	7	7	7	0	7	7	7
		Guthdu C.A.	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Guwadi CA	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Hail Dhar Pasture Development	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15
		Hail Nala C.A.	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Hailara	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Haloga	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Ichharani CA	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Indal CA	0	0	0	0	0	10	0	10	0	10	10	10	10	10	10	10
		Isali pasture development	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15
		Jaddu 1st C.A. 2021-22	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Jaddu 2nd C.A. 2021-22	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5

		Jagot CA	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Jainshree Ghar	0	3	0	3	0	0	3	3	3	3	3	3	0	3	3	3
		Jajwas	0	7	0	7	0	0	7	7	7	7	7	7	0	7	7	7
		Jamoth C.A. 2021-22	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Jhamooni C.A.	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Jinni C.A.	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Kala ban C.A	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Kalon Ghar 2021-22	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Kalopad pasture development	0	0	0	0	0	17	0	17	0	17	17	17	17	17	17	17
		Kandolu CA	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Khadwal CA	0	7	0	7	0	0	7	7	7	7	7	7	0	7	7	7
		Khajiriyala C.A. (2021-22)year	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Khakhdi	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Kharundi Dhar Pasture Development	0	0	0	0	0	17	0	17	0	17	17	17	17	17	17	17
		Kotli CA	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Kuflani DPF	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Kulthod C.A.	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Kundala C.A.	0	7	0	7	0	0	7	7	7	7	7	7	0	7	7	7
		Likdi CA	0	0	0	0	0	12	0	12	0	12	12	12	12	12	12	12
		Majhogo Pasture Development	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15
		Makkan dhar pasture development	0	0	0	0	0	18	0	18	0	18	18	18	18	18	18	18
		Makol Ki Naali	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Malikundi C.A.	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Mandralla Dhar	0	0	0	0	0	20	0	20	0	20	20	20	20	20	20	20

		Maniyala C.A.	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Mansa Dhar C.A	0	6	0	6	0	0	6	6	6	6	6	6	0	6	6	6
		Marali CA	0	12	0	12	0	0	12	12	12	12	12	12	0	12	12	12
		Matiyund Dhar Pasture Development	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Miyund Pasture Development	0	0	0	0	0	17	0	17	0	17	17	17	17	17	17	17
		Mundolu CA	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Nakuin C.A	0	0	0	0	0	12	0	12	0	12	12	12	12	12	12	12
		New C.A. Anjani	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		New C.A. phukar	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		New CA Adan Dhar	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		New CA Kalyani	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		New CA Ladrrora	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		New CA Marali Dhar	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		New CA Padhrota	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		New CA Phukar	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		New CA Randoll	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		New CA Sahu	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		New CA Shagla Ghar	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		New CA Shurnalla	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Nili nadi CA	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Nondal Pasture Development	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15
		Padharala CA	0	0	0	0	0	7	0	7	0	7	7	7	7	7	7	7
		Pakat C.A.	0	7	0	7	0	0	7	7	7	7	7	7	0	7	7	7
		Pakhurotu Dhar	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15

		Paniyala C.A.	0	8	0	8	0	0	8	8	8	8	8	8	0	8	8	8
		Paniyali CA	0	9	0	9	0	0	9	9	9	9	9	9	0	9	9	9
		Panjtara Dhar Pasture Development	0	0	0	0	0	18	0	18	0	18	18	18	18	18	18	18
		Pasture CA Mandrala Dhar 15 hact	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15
		Pasture Dev. in Khajrali Dhar (2021-22)	0	20	0	20	0	0	20	20	20	20	20	20	0	20	20	20
		Pasture Development Hindal Dhar 2021-22	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15
		Pasture Development Mandralla Dhar 2021-22	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Pasture Development Manghali Dhar (2021-22)	0	0	0	0	0	10	0	10	0	10	10	10	10	10	10	10
		Patotari CA	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Plantation Bani CA (2021-22)	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15
		Plantation Tambu C.A. (2021-22) years	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Polla CA	0	0	0	0	0	10	0	10	0	10	10	10	10	10	10	10
		Pring Closed Area (2021-22)year	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Rai goth CA (Jangbani Beat)	0	6	0	6	0	0	6	6	6	6	6	6	0	6	6	6
		Rai Goth CA	0	6	0	6	0	0	6	6	6	6	6	6	0	6	6	6

		(Sagti Beat)																
		Raje Da Dera 1st Dhar (Pasture Development)	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15
		Raje Da Dera 2nd	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Reyod C.A. (2021-22) years	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Roghad	0	0	0	0	0	12	0	12	0	12	12	12	12	12	12	12
		Rohoov C.A.	0	12	0	12	0	0	12	12	12	12	12	12	0	12	12	12
		Rouni Dhar Pasture Development	0	0	0	0	0	17	0	17	0	17	17	17	17	17	17	17
		Sagroot CA	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Sagti Dhar Pasture Development	0	0	0	0	0	12	0	12	0	12	12	12	12	12	12	12
		Sagti Nalla CA	12	0	12	0	12	0	12	12	12	12	12	0	0	12	12	12
		Sakrau Pasture Development	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15
		Saproth Dhar Pasture Development	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Sarkau pasture development	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15
		Sarotu C.A.	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Seri	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Shali Ca	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Shoul Beat	0	0	0	0	0	12	0	12	0	12	12	12	12	12	12	12
		Sikdiyah CA	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Singalu C.A. (2021-22 year)	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Singra C.A	8	0	8	0	8	0	8	8	8	8	8	0	0	8	8	8
		Sinol C.A.	0	0	0	0	0	12	0	12	0	12	12	12	12	12	12	12

		Sokhdu Panihar CA	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Suin C.A. (2021-22)	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Suin Dhar Pasture CA	15	0	15	0	15	0	15	15	15	15	15	0	0	15	15	15
		Suked C.A. 2021-22	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Supe Da Kholl C.A. 2021-22	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Tepa C.A.	0	0	0	0	0	10	0	10	0	10	10	10	10	10	10	10
		Thal CA	0	5	0	5	0	0	5	5	5	5	5	5	0	5	5	5
		Tharan C.A	0	0	0	0	0	12	0	12	0	12	12	12	12	12	12	12
		Thatti-I C.A	0	0	0	0	0	12	0	12	0	12	12	12	12	12	12	12
		Thatti-II C.A	0	8	0	8	0	0	8	8	8	8	8	8	0	8	8	8
		Topa CA	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Trakkar Dar 30 Hact. Pasture	0	0	0	0	0	30	0	30	0	30	30	30	30	30	30	30
		Trakkar Dar 60 Hact. Pasture	0	0	0	0	0	60	0	60	0	60	60	60	60	60	60	60
		Tund CA	15	0	15	0	15	0	15	15	15	15	15	0	0	15	15	15
		Upper Tain	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
4	**Dalhousie**	Chalela	0	0	0	0	0	23	0	23	0	23	23	23	23	23	23	23
		Chambi	8	0	8	0	8	0	8	8	8	8	8	0	0	8	8	8
		Dadra Phat	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Dagoh DPF	0	9	0	9	0	0	9	9	9	9	9	9	0	9	9	9
		Dharoon	6	0	6	0	6	0	6	6	6	6	6	0	0	6	6	6
		Jandrah	30	0	30	0	30	0	30	30	30	30	30	0	0	30	30	30
		Kapei	10	0	10	0	10	0	10	10	10	10	10	0	0	10	10	10
		Kapei Ghar	9	0	9	0	9	0	9	9	9	9	9	0	0	9	9	9
		Lahri	8	0	8	0	8	0	8	8	8	8	8	0	0	8	8	8
		Mornu	9	0	9	0	9	0	9	9	9	9	9	0	0	9	9	9
		Nakala (Banska)	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5

		Rouni No. 1 DPF	0	9	0	9	0	0	9	9	9	9	9	9	0	9	9	9
		Rouni No. 2 DPF	0	6	0	6	0	0	6	6	6	6	6	6	0	6	6	6
		Salig Tikkar	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Samana - I	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Samana C-II	5	0	5	0	5	0	5	5	5	5	5	0	0	5	5	5
		Samleu	0	8	0	8	0	0	8	8	8	8	8	8	0	8	8	8
	Total		**238**	**835**	**672**	**809**	**672**	**879**	**1481**	**2360**	**1481**	**2360**	**2360**	**1688**	**879**	**2360**	**2360**	**2360**

Annexure 7(b): Division Wise Projected Cost of Plantations in Natural Landscapes in Himachal Pradesh except for Protection of Forest Fire and Natural Regeneration in Himachal Pradesh

Sr. No	Division	Sitename	Year								Year					Grand Total		
			Phase I						Phase I		Phase II							
			(Rs.in Lakhs)						(Rs. in Lakhs)		(Rs. in Lakhs)							
			I	II	III	IV		V	Total		VI	VII	VIII	IX	Total	Rs. In lakhs		
			Est	Est	Est	Est	Maint	Est	Maint	Est	Maint	Maint	Maint	Maint	Maint	Est	Maint	Total Cost
1	Bharmour	Bagdu Ghar	3.8	8.55	6.2	0	3.11	0	1.66	18.28	4.76	1.29	0.05	0	0	1.34	18.28	6.1	24.38
		Chaled Ghar	0.9	13.12	6.35	0	3.33	0	1.86	20.66	5.2	1.45	0.05	0	0	1.5	20.66	6.7	27.36
		Dhuwan Nalla	0.9	13.12	6.65	0	3.33	0	1.86	20.66	5.2	1.45	0.05	0	0	1.5	20.66	6.7	27.36
2	Chamba	****Aate DPF	0	0	1.8	26.24	0	13.28	0	41.32	0	6.22	3.73	2.9	0.1	13.4	41.32	21.7	75.96
		Badath	4.75	10.69	7.41	0	3.88	0	2.03	22.85	5.95	1.61	0.02	0	0	1.67	22.85	7	30.47
		Bagga CA	0	0	3.65	20.32	0	11.5	0	35.47	0	7.60	5.74	4.71	1.55	19.15	35.47	19	54.62
		Baliani	4.75	10.69	7.41	0	3.88	0	2.07	22.85	5.95	1.61	0.06	0	0	1.67	22.85	7.29	30.47
		Bhadhor	1.01	5.65	3.19	0	1.99	0	1.59	9.85	3.58	1.31	0.43	0	0	1.74	9.85	5.32	15.17
		Bhadruni CA	2.38	5.35	3.7	0	1.94	0	1.04	11.43	2.98	0.81	0.03	0	0	0.83	11.43	3.81	15.24
		Bhala/ Sanoli DPF	0.7	10.21	5.16	0	2.59	0	1.45	16.07	4.04	1.13	0.04	0	0	1.17	16.07	5.21	21.28
		Brehi	1.2	17.49	8.85	0	4.44	0	2.49	27.55	6.93	1.93	0.07	0	0	2	27.55	8.93	36.48

		Challoga CA	0	2.03	11.94	3.98	0	0	3.43	17.95	3.43	2.77	2.29	0.87	0	5.92	17.95	9.35	27.3
		Chamla	4.28	9.62	6.67	0	3.49	0	1.86	20.57	5.36	1.45	0.05	0	0	1.5	20.57	6.86	27.43
		Chandruni Dhar	0	0	9.51	21.38	0	14.82	0	45.71	0	7.76	4.14	3.22	0.12	15.24	45.71	15.24	60.95
		Chau CA	0	0	4.75	10.69	0	7.41	0	22.85	0	3.88	2.07	1.61	0.05	7.62	22.85	7.62	30.47
		Choo	1.01	5.65	3.19	0	1.99	0	1.59	9.85	3.58	1.31	0.43	0	0	1.74	9.85	5.32	15.17
		Chubu Galla	0.7	10.21	5.16	0	2.59	0	1.45	16.07	4.04	1.13	0.04	0	0	1.17	16.07	5.21	21.28
		Chuhhani	4.75	10.69	7.41	0	3.88	0	2.07	22.85	5.95	1.61	0.06	0	0	1.67	22.85	7.62	30.47
		Daggi Ghar	2.03	11.29	6.39	0	3.98	0	3.19	19.71	7.17	2.61	0.86	0	0	3.47	19.71	10.64	30.35
		Darkund	2.85	6.41	4.44	0	2.33	0	1.24	13.71	3.57	0.97	0.03	0	0	1	13.71	4.57	18.28
		Duari	0.5	7.29	3.69	0	1.85	0	1.04	11.48	2.89	0.81	0.03	0	0	0.83	11.48	3.72	15.2
		Fati CA	3.8	8.55	5.93	0	3.11	0	1.66	18.28	4.76	1.29	0.05	0	0	1.34	18.28	6.1	24.38
		Gaggal CA	1.62	9.03	5.11	0	3.18	0	2.55	15.77	5.73	2.09	0.69	0	0	2.78	15.77	8.51	24.28
		Gandri DPF	3.8	8.55	5.93	0	3.11	0	1.66	18.2	4.76	1.29	0.05	0	0	1.34	18.2	6.1	24.38
		Ghilli	2.03	11.29	6.39	0	3.98	0	3.19	19.71	7.17	2.61	0.86	0	0	3.47	19.71	10.64	30.35
		Ghudha Gudha	1.01	5.65	3.19	0	1.99	0	1.59	9.85	3.58	1.31	0.43	0	0	1.74	9.85	5.32	15.17
		Gohanana	0.98	5.85	1.99	0	1.68	0	1.36	8.83	3.04	1.13	0.43	0	0	1.56	8.83	4.6	13.42
		Guwadi DPF	1.82	10.75	3.59	0	3.09	0	2.49	16.16	5.57	2.06	0.77	0	0	2.84	16.16	8.41	24.57
		Jamela DPF	4.75	10.69	7.41	0	3.88	0	2.07	22.85	5.95	1.61	0.06	0	0	1.67	22.85	7.62	30.47
		Jangi CA	2.43	13.55	7.67	0	4.77	0	3.83	23.65	8.6	3.14	1.03	0	0	4.17	23.65	12.77	36.41
		Jhunas	0	0	1.01	5.97	0	1.99	0	8.98	0	1.71	1.38	1.15	0.43	4.67	8.98	4.67	13.65
		Kalandra Bathri	1.2	17.49	8.85	0	4.44	0	2.49	27.55	6.93	1.93	0.07	0	0	2	27.55	8.93	36.48
		Kalandra Bathri	0	0	1.2	17.49	0	8.85	0	27.55	0	4.44	2.49	1.93	0.07	8.93	27.55	8.93	36.48
		Kalandra Ca	0	0	2.43	14.33	0	4.78	0	21.54	0	4.11	3.32	2.75	1.03	11.21	21.54	11.21	32.75
		Kalwara	4.75	10.69	7.41	0	3.88	0	2.07	22.85	5.95	1.61	0.06	0	0	1.67	22.85	7.62	30.47
		Kamotha CA	0.41	2.26	1.28	0	0.8	0	0.64	3.94	1.43	0.52	0.17	0	0	0.69	3.94	2.12	6.07
		Karpok	2.38	5.35	3.7	0	1.94	0	1.04	11.43	2.98	0.81	0.03	0	0	0.83	11.43	3.81	15.24
		Kathwar DPF	2.38	5.35	3.7	0	1.94	0	1.04	11.43	2.98	0.81	0.03	0	0	0.83	11.43	3.81	15.24
		Khaddal	0	1.01	5.97	1.99	0	0	1.71	8.98	1.71	1.38	1.15	0.43	0	2.96	8.98	4.67	13.65
		Khorgoth CA	0	0	9.03	20.31	0	14.08	0	43.42	0	7.37	3.94	3.06	0.11	14.48	43.42	14.48	57.9
		Kiratot	2.38	5.35	3.7	0	1.94	0	1.04	11.43	2.98	0.81	0.03	0	0	0.83	11.43	3.81	15.24

		Kohal Kuthes C-A	1.43	3.21	2.22	0	1.16	0	0.62	6.86	1.79	0.48	0.02	0	0	0.5	6.86	2.29	9.14
		Kundlodine	2.38	5.35	3.7	0	1.94	0	1.04	11.43	2.98	0.81	0.03	0	0	0.83	11.43	3.81	15.24
		Kuthar DPF	0.61	3.58	1.2	0	1.03	0	0.83	5.39	1.86	0.69	0.26	0	0	0.95	5.39	2.81	8.19
		Lodhar	5.23	11.76	8.15	0	4.27	0	2.28	25.14	6.55	1.77	0.06	0	0	1.84	25.14	8.39	33.52
		Lothal	4.75	10.69	7.41	0	3.88	0	2.07	22.85	5.95	1.61	0.06	0	0	1.67	22.85	7.62	30.47
		Luna	1.62	9.03	5.11	0	3.18	0	2.55	15.77	5.73	2.09	0.69	0	0	2.78	15.77	8.51	24.28
		Mandola	4.75	10.69	7.41	0	3.88	0	2.07	22.85	5.95	1.61	0.06	0	0	1.67	22.85	7.62	30.47
		Manju	1.43	3.21	2.22	0	1.16	0	0.62	6.86	1.79	0.48	0.02	0	0	0.5	6.86	2.29	9.14
		Masrond Laddi-II	2.03	11.29	6.39	0	3.98	0	3.19	19.71	7.17	2.61	0.86	0	0	3.47	19.71	10.64	30.35
		Masrond Laddi-II	1.82	10.16	5.75	0	3.58	0	2.87	17.74	6.45	2.35	0.77	0	0	3.13	17.74	9.58	27.31
		Mehla Nala	1.62	9.03	5.11	0	3.18	0	2.55	15.77	5.73	2.09	0.69	0	0	2.78	15.77	8.51	24.28
		Moha DPF	2.38	5.35	3.7	0	1.94	0	1.04	11.43	2.98	0.81	0.03	0	0	0.83	11.43	3.81	15.24
		Nagooni C.A	3.33	7.48	5.19	0	2.72	0	1.45	16	4.17	1.13	0.04	0	0	1.17	16	5.34	21.33
		Padhri	0	0	7.13	16.06	0	11.11	0	34.28	0	5.82	3.11	2.42	0.09	11.43	34.28	11.43	45.71
		Rupni D.P.F	1.62	9.03	5.11	0	3.18	0	2.55	15.77	5.73	2.09	0.69	0	0	2.78	15.77	8.51	24.28
		Ruvandi CA	0.5	7.29	3.69	0	1.85	0	1.04	11.48	2.89	0.81	0.03	0	0	0.83	11.48	3.72	15.2
		Sadoon CA	3.8	8.55	5.93	0	3.11	0	1.66	18.28	4.76	1.29	0.05	0	0	1.34	18.28	6.1	24.38
		Saklana	2.23	12.42	7.03	0	4.38	0	3.51	21.68	7.88	2.88	0.94	0	0	3.82	21.68	11.7	33.38
		Sapan	2.38	5.35	3.7	0	1.94	0	1.04	11.43	2.98	0.81	0.03	0	0	0.83	11.43	3.81	15.24
		Sarana	4.75	10.69	7.41	0	3.88	0	2.07	22.85	5.95	1.61	0.06	0	0	1.67	22.85	7.62	30.47
		Shiv Panihar	1.42	7.9	4.47	0	2.79	0	2.23	13.79	5.02	1.83	0.6	0	0	2.43	13.79	7.45	21.24
		Sulaha CA	5.7	12.83	8.89	0	4.66	0	2.49	27.42	7.14	1.93	0.07	0	0	2	27.42	9.14	36.57
		Sundri C.A	2.38	5.35	3.7	0	1.95	0	1.04	11.43	2.98	0.81	0.03	0	0	0.83	11.43	3.81	15.24
		Thalli D.P.F	0.95	2.12	1.48	0	0.78	0	0.41	4.57	1.19	0.32	0.01	0	0	0.33	4.57	1.52	6.09
		Tikrigarh DPF	1.01	5.65	3.19	0	1.99	0	1.59	9.85	3.58	1.31	0.43	0	0	1.74	9.85	5.32	15.17
		Tolai DPF	0	1.43	3.24	2.22	0	0	1.16	6.86	1.16	0.62	0.48	0.02	0	1.14	6.86	2.28	9.14
		Udai Nallah	4.28	9.62	6.67	0	3.49	0	1.86	20.57	5.36	1.45	0.05	0	0	1.5	20.57	6.86	27.43
		Uteep C.A	1.42	7.9	4.47	0	2.79	0	2.23	13.79	5.02	1.83	0.6	0	0	2.43	13.79	7.45	21.24
3	**Churah**	Ainthen Dhar Pasture Development	0	0	1.8	26.24	0	13.28	0	41.32	0	6.67	3.73	2.9	0.1	13.4	41.32	13.4	54.72

		Aoun Dhar Pasture Development	0	1	14.58	7.38	0	0	3.7	22.95	3.7	2.07	1.61	0.06	0	3.74	22.95	7.44	30.4
		Badhel / Bambeu	0	2.03	11.29	6.39	0	0	3.98	19.71	3.98	3.19	2.61	0.86	0	6.66	19.71	10.64	30.35
		Baggi DPF	0	1.01	5.65	3.19	0	0	1.99	9.85	1.99	1.59	1.31	0.43	0	3.33	9.85	5.32	15.17
		Bhadsar CA	0	0	2.43	13.55	0	7.67	0	23.65	0	4.77	3.83	3.14	1.03	12.77	23.65	12.77	36.41
		Bhangaid CA	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		Bhangwad C.A	0	1	14.58	7.38	0	0	3.7	22.95	3.7	2.07	1.61	0.06	0	3.74	22.95	7.44	30.4
		Bhatiyund Ghar 2021-22	0	1.01	5.65	3.19	0	0	1.99	9.85	1.99	1.59	1.31	0.43	0	3.33	9.85	5.32	15.17
		Bidha Pasture Development	0	7.13	16.04	11.11	0	0	5.82	34.28	5.82	3.11	2.42	0.09	0	5.61	34.28	11.43	45.71
		Butla 2nd	2.38	5.35	3.7	0	1.94	0	1.04	11.43	2.98	0.81	0.03	0	0	0.83	11.43	3.81	15.24
		Chabadh CA	0	5.7	12.83	8.89	0	0	4.66	27.42	4.66	2.49	1.93	0.07	0	4.49	27.42	9.15	36.57
		Chachul CA	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		Chachul dhar pasture development	0	7.13	16.04	11.11	0	0	5.82	34.28	5.82	3.11	2.42	0.09	0	5.61	34.28	11.43	45.71
		Chamwas CA	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		Chandi Mandralla Dhar	0	0	9.51	21.38	0	14.82	0	45.71	0	7.76	4.14	3.22	0.12	15.24	45.71	15.24	60.95
		Chanjali CA	0	0	5.7	12.83	0	8.89	0	27.42	0	4.66	2.49	1.93	0.07	9.15	27.42	9.15	36.57
		Chiugali CA	0	1	14.58	7.38	0	0	3.7	22.95	3.7	2.07	1.61	0.06	0	3.74	22.95	7.44	30.4
		Dadiyund CA	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		Daloran	4.75	10.69	7.41	0	3.88	0	2.07	22.85	5.95	1.61	0.06	0	0	1.67	22.85	7.62	30.47
		Damtaal CA	0	1	14.58	7.38	0	0	3.7	22.95	3.7	2.07	1.61	0.06	0	3.74	22.95	7.44	30.4
		Dar	0	1	14.58	7.38	0	0	3.7	22.95	3.7	2.07	1.61	0.06	0	3.74	22.95	7.44	30.4
		Dehal Pasture Development	0	0	1.5	21.87	0	11.06	0	34.43	0	5.56	3.11	2.42	0.09	11.17	34.43	11.17	45.6
		Dellu C.A	0	0.7	10.21	5.16	0	0	2.59	16.07	2.59	1.45	1.13	0.04	0	2.62	16.07	5.21	21.28
		Dhabbi-1st-C.A.	0	0.5	7.29	3.69	0	0	1.85	11.48	1.85	1.04	0.81	0.03	0	1.87	11.48	3.72	15.2
		Dhabbi-2nd-C.A.	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		Dhaneli CA	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		Dhar Chammed	0	0	23.77	53.46	0	37.04	0	114.26	0	19.41	10.36	8.05	0.29	38.11	114.26	38.11	152.37

		Pasture Development																
		Dharopad C.A.	2.38	5.35	3.7	0	1.94	0	1.04	11.43	2.98	0.81	0.03	0	0	0.83	11.43	3.81	15.24
		Dhel Top CA	0	0.8	11.66	5.9	0	0	2.96	18.36	2.96	1.66	1.29	0.05	0	2.99	18.36	5.95	24.32
		Dibhari CA	0	0	7.13	16.04	0	11.11	0	34.28	0	5.82	3.11	2.42	0.09	11.43	34.28	11.43	45.71
		Dol Ghar	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		Dudra	0	0	19.01	42.76	0	29.63	0	91.41	0	15.53	8.28	6.44	0.23	30.49	91.41	30.49	121.9
		Dumes C.A.	0	0	5.7	12.83	0	8.89	0	27.42	0	4.66	2.49	1.93	0.07	9.15	27.42	9.15	36.57
		Dunwad C.A	0	4.28	9.62	6.67	0	0	3.49	20.57	3.49	1.86	1.45	0.05	0	3.37	20.57	6.86	27.43
		Fangei CA	1.01	5.65	3.19	0	1.99	0	1.59	9.85	3.58	1.31	0.43	0	0	1.74	9.85	5.32	15.17
		Gagal C.A.	0	2.03	11.29	6.39	0	0	3.98	19.71	3.98	3.19	2.61	0.86	0	6.66	19.71	10.64	30.35
		Ganed	0	2.03	11.29	6.39	0	0	3.98	19.71	3.98	3.19	2.61	0.86	0	6.66	19.71	10.64	30.35
		Ghadetra Ghar Land Slide /Slips	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		Googlotu C.A.	0	3.8	8.55	5.93	0	0	3.11	18.28	3.11	1.66	1.29	0.05	0	2.99	18.28	6.1	24.38
		Goongoth C.A.	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		Goth C.A	0	0	5.23	11.76	0	8.15	0	25.14	0	4.27	2.28	1.77	0.06	8.38	25.14	8.38	33.52
		Grohan CA	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		Guery	0	0.7	10.21	5.16	0	0	2.59	16.07	2.59	1.45	1.13	0.04	0	2.62	16.07	5.21	21.28
		Guthdu C.A.	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		Guwadi CA	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		Hail Dhar Pasture Development	0	0	1.5	21.87	0	11.06	0	34.43	0	5.56	3.11	2.42	0.09	11.17	34.43	11.17	45.6
		Hail Nala C.A.	0	1	14.58	7.38	0	0	3.7	22.95	3.7	2.07	1.61	0.06	0	3.74	22.95	7.44	30.4
		Hailara	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		Haloga	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		Ichharani CA	4.75	10.69	7.41	0	3.88	0	2.07	22.85	5.95	1.61	0.06	0	0	1.67	22.85	7.62	30.47
		Indal CA	0	0	2.03	11.29	0	6.39	0	19.71	0	3.98	3.19	2.61	0.86	10.64	19.71	10.64	30.35
		Isali pasture development	0	0	7.13	16.04	0	11.11	0	34.28	0	5.82	3.11	2.42	0.09	11.43	34.28	11.43	45.71
		Jaddu 1st C.A. 2021-22	0	1.01	5.65	3.19	0	0	1.99	9.85	1.99	1.59	1.31	0.43	0	3.33	9.85	5.32	15.17

		Jaddu 2nd C.A. 2021-22	0	1.01	5.65	3.19	0	0	1.99	9.85	1.99	1.59	1.31	0.43	0	3.33	9.85	5.32	15.17
		Jagot CA	0.5	7.29	3.69	0	1.85	0	1.04	11.48	2.89	0.81	0.03	0	0	0.83	11.48	3.72	15.2
		Jainshree Ghar	0	0.3	4.37	2.21	0	0	1.11	6.89	1.11	0.62	0.48	0.02	0	1.12	6.89	2.23	9.12
		Jajwas	0	0.7	10.21	5.16	0	0	2.59	16.07	2.59	1.45	1.13	0.04	0	2.62	16.07	5.21	21.28
		Jamoth C.A. 2021-22	4.75	10.69	7.41	0	3.88	0	2.07	22.85	5.95	1.61	0.06	0	0	1.67	22.85	7.62	30.47
		Jhamooni C.A.	1	14.58	7.38	0	3.7	0	2.07	22.95	5.77	1.61	0.06	0	0	1.67	22.95	7.44	30.4
		Jinni C.A.	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		Kala ban C.A	0	1	14.58	7.38	0	0	3.7	22.95	3.7	2.07	1.61	0.06	0	3.74	22.95	7.44	30.4
		Kalon Ghar 2021-22	0	1.01	5.65	3.19	0	0	1.99	9.85	1.99	1.59	1.31	0.43	0	3.33	9.85	5.32	15.17
		Kalopad pasture development	0	0	1.7	24.78	0	12.54	0	39.02	0	6.3	3.52	2.74	0.1	12.65	39.02	12.65	51.68
		Kandolu CA	0	2.03	11.29	6.39	0	0	3.98	19.71	3.98	3.19	2.61	0.86	0	6.66	19.71	10.64	30.35
		Khadwal CA	0	3.33	7.48	5.19	0	0	2.72	16	2.72	1.45	1.13	0.04	0	2.62	16	5.34	21.33
		Khajiriyala C.A. (2021-22)year	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		Khakhdi	0	2.03	11.29	6.39	0	0	3.98	19.71	3.98	3.19	2.61	0.86	0	6.66	19.71	10.64	30.35
		Kharundi Dhar Pasture Development	0	0	8.08	18.17	0	12.59	0	38.85	0	6.6	3.52	2.74	0.1	12.96	38.85	12.96	51.81
		Kotli CA	0	0.5	7.29	3.69	0	0	1.85	11.48	1.85	1.04	0.81	0.03	0	1.87	11.48	3.72	15.2
		Kuflani DPF	0	1	14.58	7.38	0	0	3.7	22.95	3.7	2.07	1.61	0.06	0	3.74	22.95	7.44	30.4
		Kulthod C.A.	0	1	14.58	7.38	0	0	3.7	22.95	3.7	2.07	1.61	0.06	0	3.74	22.95	7.44	30.4
		Kundala C.A.	0	3.33	7.48	5.19	0	0	2.72	16	2.72	1.45	1.13	0.04	0	2.62	16	5.34	21.33
		Likdi CA	0	0	1.2	17.49	0	8.85	0	27.55	0	4.44	2.49	1.93	0.07	8.93	27.55	8.93	36.48
		Majhogo Pasture Development	0	0	1.5	21.87	0	11.06	0	34.43	0	5.56	3.11	2.42	0.09	11.17	34.43	11.17	45.6
		Makkan dhar pasture development	0	0	1.8	26.24	0	13.28	0	41.32	0	6.67	3.73	2.9	0.1	13.4	41.32	13.4	54.72
		Makol Ki Naali	0	0.5	7.29	3.69	0	0	1.85	11.48	1.85	1.04	0.81	0.03	0	1.87	11.48	3.72	15.2
		Malikundi C.A.	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47

		Mandralla Dhar	0	0	9.51	21.38	0	14.82	0	45.71	0	7.76	4.14	3.22	0.12	15.24	45.71	15.24	60.95
		Maniyala C.A.	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		Mansa Dhar C.A	0	2.85	6.41	4.44	0	0	2.33	13.71	2.33	1.24	0.97	0.03	0	2.24	13.71	4.57	18.28
		Marali CA	0	5.7	12.83	8.89	0	0	4.66	27.42	4.66	2.49	1.93	0.07	0	4.49	27.42	9.15	36.57
		Matiyund Dhar Pasture Development	0	1	14.58	7.38	0	0	3.7	22.95	3.7	2.07	1.61	0.06	0	3.74	22.95	7.44	30.4
		Miyund Pasture Development	0	0	8.08	18.17	0	12.59	0	38.85	0	6.6	3.52	2.74	0.1	12.96	38.85	12.96	51.81
		Mundolu CA	4.75	10.69	7.41	0	3.88	0	2.07	22.85	5.95	1.61	0.06	0	0	1.67	22.85	7.62	30.47
		Nakuin C.A	0	0	5.7	12.83	0	8.89	0	27.42	0	4.66	2.49	1.93	0.07	9.15	27.42	9.15	36.57
		New C.A. Anjani	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		New C.A. phukar	0	0.5	7.29	3.69	0	0	1.85	11.48	1.85	1.04	0.81	0.03	0	1.87	11.48	3.72	15.2
		New CA Adan Dhar	0	1	14.58	7.38	0	0	3.7	22.95	3.7	2.07	1.61	0.06	0	3.74	22.95	7.44	30.4
		New CA Kalyani	0	0.5	7.29	3.69	0	0	1.85	11.48	1.85	1.04	0.81	0.03	0	1.87	11.48	3.72	15.2
		New CA Ladrrora	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		New CA Marali Dhar	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		New CA Padhrota	0	0.5	7.29	3.69	0	0	1.85	11.48	1.85	1.04	0.81	0.03	0	1.87	11.48	3.72	15.2
		New CA Phukar	0	0.5	7.29	3.69	0	0	1.85	11.48	1.85	1.04	0.81	0.03	0	1.87	11.48	3.72	15.2
		New CA Randoll	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		New CA Sahu	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		New CA Shagla Ghar	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		New CA Shurnalla	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		Nili nadi CA	0	1	14.58	7.38	0	0	3.7	22.95	3.7	2.07	1.61	0.06	0	3.74	22.95	7.44	30.4
		Nondal Pasture Development	0	0	1.5	21.87	0	11.06	0	34.43	0	5.56	3.11	2.42	0.09	11.17	34.43	11.17	45.6
		Padharala CA	0	0	3.33	7.48	0	5.19	0	16	0	2.72	1.45	1.13	0.04	5.34	16	5.34	21.33
		Pakat C.A.	0	0.7	10.21	5.16	0	0	2.59	16.07	2.59	1.45	1.13	0.04	0	2.62	16.07	5.21	21.28
		Pakhurotu Dhar	0	0	1.5	21.87	0	11.06	0	34.43	0	5.56	3.11	2.42	0.09	11.17	34.43	11.17	45.6
		Paniyala C.A.	0	0.8	11.66	5.9	0	0	2.96	18.36	2.96	1.66	1.29	0.05	0	2.99	18.36	5.95	24.32

		Paniyali CA	0	4.28	9.62	6.67	0	0	3.49	20.57	3.49	1.86	1.45	0.05	0	3.37	20.57	6.86	27.43
		Panjtara Dhar Pasture Development	0	0	8.56	19.24	0	13.33	0	41.14	0	6.99	3.73	2.9	0.1	13.72	41.14	13.72	54.85
		Pasture CA Mandrala Dhar 15 hact	0	0	0	18.2	0	6.13	0	24.32	0	4.2	3.11	2.42	0.09	9.81	24.32	9.81	34.13
		Pasture Dev. in Khajrali Dhar (2021-22)	0	0	24.26	8.17	0	0	5.6	32.43	5.6	4.14	3.22	0.12	0	7.48	32.43	13.08	45.51
		Pasture Development Hindal Dhar 2021-22	0	0	0	18.2	0	6.13	0	24.32	0	4.2	3.11	2.42	0.09	9.81	24.32	9.81	34.13
		Pasture Development Mandralla Dhar 2021-22	0	0	12.13	4.09	0	0	2.8	16.22	2.8	2.07	1.61	0.06	0	3.74	16.22	6.54	22.76
		Pasture Development Manghali Dhar (2021-22)	0	0	0	12.13	0	4.09	0	16.22	0	2.8	2.07	1.61	0.06	6.54	16.22	6.54	22.76
		Patotari CA	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		Plantation Bani CA (2021-22)	0	0	7.13	16.04	0	11.11	0	34.28	0	5.82	3.11	2.42	0.09	11.43	34.28	11.43	45.71
		Plantation Tambu C.A. (2021-22) years	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		Polla CA	0	0	4.75	10.69	0	7.41	0	22.85	0	3.88	2.07	1.61	0.06	7.62	22.85	7.62	30.47
		Pring Closed Area (2021-22)year	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		Rai goth CA (Jangbani Beat)	0	0.6	8.75	4.43	0	0	2.22	13.77	2.22	1.24	0.97	0.03	0	2.24	13.77	4.46	18.24
		Rai Goth CA (Sagti Beat)	0	2.85	6.41	4.44	0	0	2.33	13.71	2.33	1.24	0.97	0.03	0	2.24	13.71	4.57	18.28
		Raje Da Dera 1st Dhar (Pasture Development)	0	0	0	18.2	0	6.13	0	24.32	0	4.2	3.11	2.42	0.09	9.81	24.32	9.81	34.13

		Raje Da Dera 2nd	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		Reyod C.A. (2021-22) years	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		Roghad	0	0	5.7	12.83	0	8.89	0	27.42	0	4.66	2.49	1.93	0.07	9.15	27.42	9.15	36.57
		Rohoov C.A.	0	5.7	12.83	8.89	0	0	4.66	27.42	4.66	2.49	1.93	0.07	0	4.49	27.42	9.15	36.57
		Rouni Dhar Pasture Development	0	0	8.08	18.17	0	12.59	0	38.85	0	6.6	3.52	2.74	0.1	12.96	38.85	12.96	51.81
		Sagroot CA	0	0.5	7.29	3.69	0	0	1.85	11.48	1.85	1.04	0.81	0.03	0	1.87	11.48	3.72	15.2
		Sagti Dhar Pasture Development	0	0	1.2	17.49	0	8.85	0	27.55	0	4.44	2.49	1.93	0.07	8.93	27.55	8.93	36.48
		Sagti Nalla CA	5.7	12.83	8.89	0	4.66	0	2.49	27.42	7.14	1.93	0.07	0	0	2	27.42	9.14	36.57
		Sakrau Pasture Development	0	0	7.13	16.04	0	11.11	0	34.28	0	5.82	3.11	2.42	0.09	11.43	34.28	11.43	45.71
		Saproth Dhar Pasture Development	0	1	14.58	7.38	0	0	3.7	22.95	3.7	2.07	1.61	0.06	0	3.74	22.95	7.44	30.4
		Sarkau pasture development	0	0	7.13	16.04	0	11.11	0	34.28	0	5.82	3.11	2.42	0.09	11.43	34.28	11.43	45.71
		Sarotu C.A.	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		Seri	0	1	14.58	7.38	0	0	3.7	22.95	3.7	2.07	1.61	0.06	0	3.74	22.95	7.44	30.4
		Shali Ca	0	1.01	5.97	1.99	0	0	1.71	8.98	1.71	1.38	1.15	0.43	0	2.96	8.98	4.67	13.65
		Shoul Beat	0	0	5.7	12.83	0	8.89	0	27.42	0	4.66	2.49	1.93	0.07	9.15	27.42	9.15	36.57
		Sikdiyah CA	0	0.5	7.29	3.69	0	0	1.85	11.48	1.85	1.04	0.81	0.03	0	1.87	11.48	3.72	15.2
		Singalu C.A. (2021-22 year)	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		Singra C.A	3.33	8.55	5.93	0	3.11	0	1.66	18.28	4.76	1.29	0.05	0	0	1.34	18.28	6.1	24.38
		Sinol C.A.	0	0	1.2	17.49	0	8.85	0	27.55	0	4.44	2.49	1.93	0.07	8.93	27.55	8.93	36.48
		Sokhdu Panihar CA	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.81	0.03	0	1.87	11.43	3.81	15.24
		Suin C.A. (2021-22)	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		Suin Dhar Pasture CA	0	18.2	6.13	0	4.2	0	3.11	24.32	7.31	2.42	0.09	0	0	2.5	24.32	9.81	34.13

		Suked C.A. 2021-22	0	4.75	10.69	7.41	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.74	22.85	7.62	30.47
		Supe Da Kholl C.A. 2021-22	4.75	10.69	7.41	0	3.39	0	2.07	22.85	5.95	1.61	0.06	0	0	1.67	22.85	7.62	30.47
		Tepa C.A.	0	0	4.75	10.69	0	7.43	0	22.85	0	3.88	2.29	1.61	0.06	7.62	22.85	7.62	30.47
		Thal CA	0	2.38	5.35	3.7	0	0	1.94	11.43	1.94	1.04	0.35	0.03	0	1.87	11.43	3.81	15.24
		Tharan C.A	0	0	5.7	12.83	0	8.89	0	27.42	0	4.66	2.49	1.93	0.07	9.15	27.42	9.15	36.57
		Thatti-I C.A	0	0	5.7	12.83	0.5	8.89	0	27.42	0	4.66	2.49	1.93	0.07	9.58	27.42	9.15	36.57
		Thatti-II C.A	0	3.8	8.55	5.93	0	0	3.11	18.28	3.23	1.66	1.29	0.05	0	2.99	18.28	6.1	24.38
		Topa CA	4.75	10.69	7.41	0	3.88	0	2.07	22.85	5.95	1.61	0.06	0	0	1.67	22.85	7.62	30.47
		Trakkar Dar 30 Hact. Pasture	0	0	14.26	32.07	0	22.22	0	68.56	0	11.64	6.21	4.83	0.14	22.86	68.56	22.86	91.42
		Trakkar Dar 60 Hact. Pasture	0	0	28.52	64.15	0	44.45	0	137.19	0	23.15	12.43	9.55	0.35	44.73	137.19	45.73	182.85
		Tund CA	7.63	16.06	11.11	0	5.82	0	3.2	34.28	8.93	2.42	0.09	0	0	2.99	34.28	11.51	45.71
		Upper Tain	0	4.75	10.63	7.4	0	0	3.88	22.85	3.88	2.07	1.61	0.06	0	3.78	22.85	7.62	30.46
4	**Dalhousie**	Chalela	0	0	4.66	25.97	0	14.7	0	45.31	0	9.15	7.33	6.01	1.98	24.47	45.31	24.47	69.8
		Chambi	1.57	9.36	3.19	0	2.69	0	2.18	14.12	4.86	1.8	0.69	0	0	2.49	14.12	7.35	21.46
		Dadra Phat	0.98	5.85	1.99	0	1.68	0	1.36	8.83	3.04	1.13	0.43	0	0	1.56	8.83	4.6	13.42
		Dagoh DPF	0	1.76	10.53	3.59	0	0	3.02	15.89	3.02	2.44	2.03	0.77	0	5.24	15.89	8.26	24.15
		Dharoon	1.22	6.77	3.83	0	2.39	0	1.91	11.82	4.3	1.57	0.52	0	0	2.08	11.82	6.38	18.21
		Jandrah	6.08	33.38	19.17	0	11.94	0	9.56	59.12	21.5	7.84	2.58	0	0	10.42	59.12	31.92	91.04
		Kapei	1.96	11.76	3.98	0	3.38	0	2.72	17.65	6.07	2.25	0.86	0	0	3.11	17.65	9.18	26.83

		Kapei Ghar	1.82	10.16	5.75	0	3.58	0	2.87	17.74	6.45	2.35	0.77	0	0	3.13	17.74	9.58	27.31
		Lahri	1.57	9.36	3.19	0	2.69	0	2.17	14.12	4.86	1.8	0.69	0	0	2.49	14.12	7.35	21.47
		Mornu	1.82	10.16	5.75	0	3.58	0	2.87	17.74	6.45	2.35	0.86	0	0	3.13	17.74	9.58	27.31
		Nakala (Banska)	1.01	5.97	1.99	0	1.71	0	1.38	8.98	3.1	1.15	0.43	0	0	1.58	8.98	4.68	13.65
		Rouni No. 1 DPF	0	1.82	10.16	5.75	0	0	3.58	17.74	3.58	2.87	2.35	0.77	0	5.97	17.74	9.57	27.31
		Rouni No. 2 DPF	0	1.18	7.06	2.39	0	0	2.01	10.59	2.01	1.63	1.35	0.52	0	3.5	10.59	5.51	16.1
		Salig Tikkar	1	5.65	3.19	0	1.95	0	1.59	9.85	3.58	1.31	0.43	0	0	1.74	9.85	5.32	15.17
		Samana - I	1.03	5.65	3.19	0	1.99	0	1.59	9.85	3.58	1.31	0.43	0	0	1.74	9.85	5.32	15.17
		Samana C-II	1.01	5.65	3.19	0	1.99	0	1.59	9.85	3.58	1.31	0.43	0	0	1.74	9.85	5.3	15.17
		Samleu	0	1.57	9.36	3.19	0	0	2.69	14.12	2.69	2.17	1.7	0.69	0	4.66	14.12	7.35	21.47
Total			**211.56**	**1016.28**	**1722.34**	**1594.3**	**257.09**	**620.04**	**470.68**	**5164.52**	**727.77**	**643.6**	**356.32**	**163.94**	**11.52**	**1175.39**	**5164.52**	**1902.77**	**7067.68**

Annexure 8(a): Division Wise Proposed Extent of Plantations in Natural Landscapes for Protection of Forest Fire and Natural Regeneration in Himachal Pradesh

Sr. No	Division	Cost Model	YEAR										
			Phase I (Extent of Area in ha)						Phase I		Phase II	Phase I &II	
			I	II		III	IV	V	Total		VI	Total Area ha	
			*Estb	Estb	**Maint	Maint	Maint	Maint	Estb	Maint	Total Maint	Estb	Maint
1	Bharmour	RV/HP/NL/11 Protection Model for Natural Regeneration	180.00	-	180.00	180.00	180.00	180.00	180.00	180.00	-	180.00	180.00
		RV/HP/NL/12 Fire Protection Model	15.00	-	15.00	15.00	15.00	15.00	15.00	15.00	-	15.00	15.00
2	Chamba	RV/HP/NL/11 Protection Model for Natural Regeneration	220.00	-	220.00	220.00	220.00	220.00	220.00	220.00	-	220.00	220.00
		RV/HP/NL/12 Fire Protection Model	40.00	-	40.00	40.00	40.00	40.00	40.00	40.00	-	40.00	40.00
3	Churah	RV/HP/NL/11 Protection Model for Natural Regeneration	-	260.0	-	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00

		RV/HP/NL/12 Fire Protection Model	30.00	0	30.00	30.00	30.00	30.00	30.00	30.00	-	30.00	30.00
4	**Dalhousie**	RV/HP/NL/11 Protection Model for Natural Regeneration	60.00	-	60.00	60.00	60.00	60.00	60.00	60.00	-	60.00	60.00
		RV/HP/NL/12 Fire Protection Model	100.00	-	100.00	100.00	100.00	100.00	100.00	100.00	-	100.00	100.00
Total			**645.0**	**260.0**	**645.00**	**905.00**	**905.00**	**905.00**	**905.00**	**905.00**	**260.00**	**905.00**	**905.00**

*****The area shown is virtually for calculation of Budget part. However actual creation of plantation work will start from 3rd year onwards.

*Est.=Establishment; and **Maint.=Maintenance

Annexure 8(b): Division Wise Proposed Cost of Plantations in Natural Landscapes for Protection of Forest Fire and Natural Regeneration in Himachal Pradesh

Sr. No	Division	Cost Models	Phase I: Year Wise Cost (Rs in Lakhs)							Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakh)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
			I	II		III		IV	V			VI				
			*Estb	Estb	**Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Bharmour	RV/HP/NL/11 Protection Model for Natural Regeneration	230.94	-	27.7	-	25.59	23.71	14.67	230.94	91.67	-	-	230.94	91.67	322.61
		RV/HP/NL/12 Fire Protection Model	4.93	-	3.67	-	3.64	3.59	3.51	4.93	14.41	-	-	4.93	14.41	19.34
2	Chamba	RV/HP/NL/11 Protection Model for Natural Regeneration	282.26	-	33.86	-	31.28	28.98	17.93	282.26	112.05	-	-	282.26	112.05	394.31

		RV/HP/NL/12 Fire Protection Model	13.15	-	9.78	-	9.71	9.57	9.36	13.15	38.42	-	-	13.15	38.42	51.57
3	**Churah**	RV/HP/NL/11 Protection Model for Natural Regeneration	-	333.58	-	-	40.01	36.96	34.25	333.58	111.22	21.18	21.18	333.58	132.4	465.98
		RV/HP/NL/12 Fire Protection Model	9.86	-	7.34	-	7.28	7.18	7.02	9.86	28.82	-	-	9.86	-	38.68
4	**Dalhousie**	RV/HP/NL/11 Protection Model for Natural Regeneration	76.98	-	9.24	-	8.52	7.9	4.88	76.98	30.54	-	-	76.98	30.54	107.52
		RV/HP/NL/12 Fire Protection Model	32.86	-	24.46	-	24.27	23.92	23.41	32.86	96.06	-	-	32.86	96.06	128.92
Total			**650.98**	**333.58**	**116.05**	**0**	**150.3**	**141.81**	**115.03**	**984.56**	**523.19**	**21.18**	**21.18**	**984.56**	**515.55**	**1528.93**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 9(a): Division Wise Proposed Extent of Plantations in Agriculture Landscapes in Himachal Pradesh

Sr. No	Division	Cost Model	YEAR											Grand Total Area (ha)	
			Phase I (Extent of Area in ha)							Phase I		Phase II			
			I	II		III		IV	V	Total		VI	Total		
			*Estb	Estb	**Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Total	Estb.	Maint
1	Bharmour	RV/HP/AL/01 - Boundary Plantation Model	10	20	10.0	15	30	45	35	45	45	15	15	45	45
		RV /HP/AL/02 Planting of Economic Trees in Block Plantation	3	2	3.00	3	5	8	5	8	8	3	3	8	8
2	Chamba	RV/HP/AL/01 - Boundary Plantation Model	20	15	20.0	0	35	35	15	35	35	0	0	35	35

		RV /HP/AL/02 Planting of Economic Trees in Block Plantation	2	3	2.00	2	5	7	5	7	7	2	2	7	7
3	**Churah**	RV/HP/AL/01 - Boundary Plantation Model	20	15	20.0	10	35	45	25	45	45	10	10	45	45
		RV /HP/AL/02 Planting of Economic Trees in Block Plantation	3	2	3.00	2	5	7	4	7	7	2	2	7	7
4	**Dalhousie**	RV/HP/AL/01 - Boundary Plantation Model	15	20	15.0	15	35	50	35	50	50	15	15	50	50
		RV /HP/AL/02 Planting of Economic Trees in Block Plantation	3	2	3.00	2	5	7	4	7	7	2	2	7	7
Total			**76**	**79**	**76**	**49**	**155**	**204**	**128**	**204**	**204**	**49**	**49**	**204**	**204**

*Est.= Establishment; and **Maint.=Maintenance

Annexure 9(b): Division Wise Projected Cost of Plantations in Agriculture Landscapes in Himachal Pradesh

Sr. No	Division	Cost Models	Phase I: Year Wise Cost (Rs in Lakhs)							Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
			I	II		III		IV	V			VI Year				
			*Estb	Estb	**Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Bharmour	RV/HP/AL/01 Boundary Plantation Model	0.9	1.8	0.48	1.35	1.48	2.3	1.87	4.05	6.13	0.83	0.83	4.05	6.96	11.01
		RV /HP/AL/02 Planting of Economic Trees in Block Plantation	1.44	0.96	0.77	1.44	1.33	2.2	1.41	3.84	5.71	0.88	0.88	3.84	6.59	10.43
2	Chamba	RV/HP/AL/01 Boundary Plantation Model	1.8	1.35	0.96	0	1.76	1.87	0.83	3.15	5.42	0	0	3.15	5.42	8.57

		RV /HP/AL/02 Planting of Economic Trees in Block Plantation	0.96	1.44	0.51	0.96	1.32	1.92	1.43	3.36	5.18	0.59	0.59	3.36	5.77	9.13
3	**Churah**	RV/HP/AL/01 Boundary Plantation Model	1.8	1.35	0.96	0.9	1.75	2.35	1.35	4.05	6.41	0.55	0.55	4.05	6.96	11.01
		RV /HP/AL/02 Planting of Economic Trees in Block Plantation	1.44	0.96	0.77	0.96	1.33	1.94	1.14	3.36	5.18	0.59	0.59	3.36	5.77	9.13
4	**Dalhousie**	RV/HP/AL/01 Boundary Plantation Model	1.35	1.8	0.72	1.35	1.73	2.58	1.87	4.5	6.9	0.83	0.83	4.5	7.73	12.23
		RV /HP/AL/02 Planting of Economic Trees in Block Plantation	1.44	0.96	0.77	0.96	1.33	1.94	1.14	3.36	5.18	0.59	0.59	3.36	5.77	9.13
Total			**11.13**	**10.62**	**5.94**	**7.92**	**12.03**	**17.1**	**11.04**	**29.67**	**46.11**	**4.86**	**4.86**	**29.67**	**50.97**	**80.64**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 10 (a): Division Wise Proposed Extent of Plantations in Urban Landscapes in Himachal Pradesh

Sr. No	Division	Cost Model	YEAR										Grand Total Area (ha)	
			Phase I (Extent of Area in ha)							Phase I		Phase II			
			I	II		III		IV	V	Total		VI	Total		
			*Estb	Estb	**Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Total	Estb.	Maint
1	Bharmour	RV/HP/UL/01 Riverfront Development	0	0.50	0	0	0.50	0.50	0.50	0.50	0.50	0	0	0.50	0.50
		RV/HP/UL/02 Institutional and Industrial Estate Plantations	9.00	6.00	9.00	5.00	15.00	20.00	11.00	20.00	20.00	5.00	5.00	20.00	20.00
		RV/HP/UL/03 Eco park Development	0	1.00	0	0.50	1.00	1.50	1.50	1.50	1.50	0.50	0.50	1.50	1.50
2	Chamba	RV/HP/UL/01 Riverfront Development	0	0.50	0	0.50	0.50	1.00	1.00	1.00	1.00	0.50	0.50	1.00	1.00
		RV/HP/UL/02 Institutional and Industrial Estate Plantations	10.00	15.00	10.00	10.00	25.00	35.00	25.00	35.00	35.00	10.00	10.00	35.00	35.00

		RV/HP/UL/03 Eco park Development	0	1.40	0	2.20	1.40	3.60	3.60	3.60	3.60	2.20	2.20	3.60	3.60
3	**Churah**	RV/HP/UL/02 Institutional and Industrial Estate Plantations	8.00	10.00	8.00	7.00	18.00	25.00	17.00	25.00	25.00	7.00	7.00	25.00	25.00
		RV/HP/UL/03 Eco park Development	0	0	0	0.90	0	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
4	**Dalhousie**	RV/HP/UL/01 Riverfront Development	0	0.50	0	0	0.50	0.50	0.50	0.50	0.50	0	0	0.50	0.50
		RV/HP/UL/02 Institutional and Industrial Estate Plantations	8.00	8.00	8.00	8.00	16.00	24.00	16.00	24.00.	24.00	8.00	8.00	24.00	24.00
		RV/HP/UL/03 Eco park Development	0	0.50	0	0.70	0.50	1.20	1.20	1.20	1.20	0.70	0.70	1.20	1.20
Total			**35.00**	**43.40**	**35.00**	**34.80**	**78.40**	**113.20**	**78.20**	**113.20**	**113.20**	**34.80**	**34.80**	**113.20**	**113.20**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 10 (b): Division Wise Proposed Cost of Plantations in Urban Landscapes in Himachal Pradesh

Sr. No	Division	Cost Models	Phase I: Year Wise Cost (Rs in Lakhs)							Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
			I	II		III		IV	V			VI Year				
			*Estb	Estb	**Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Bharmour	RV/HP/UL/01 Riverfront Development	0	75	0	0	22.5	15	11.25	75	48.75	0	0	75	48.75	123.75
		RV/HP/UL/02 Institutional and Industrial Estate Plantations	23.4	15.6	7.02	13	9.36	10.53	4.94	52	31.85	1.95	1.95	52	33.8	85.8
		RV/HP/UL/03 Eco park Development	0	150	0	75	45	52.5	37.5	225	135	11.25	11.25	225	146.25	371.25
2	Chamba	RV/HP/UL/01 Riverfront Development	0	75	0	75	22.5	37.5	26.25	150	86.25	11.25	11.25	150	97.5	247.5

		RV/HP/UL/02 Institutional and Industrial Estate Plantations	26	39	7.8	26	16.9	19.5	11.05	91	55.25	3.9	3.9	91	59.15	150.15
		RV/HP/UL/03 Eco park Development	0	210	0	330	63	141	97.5	540	301.5	49.5	49.5	540	351	891
3	**Churah**	RV/HP/UL/02 Institutional and Industrial Estate Plantations	20.8	26	6.24	18.2	11.96	13.78	7.54	65	39.52	2.73	2.73	65	42.25	107.25
		RV/HP/UL/03 Eco park Development	0	0	0	135	0	40.5	27	135	67.5	20.25	20.25	135	87.75	222.75
4	**Dalhousie**	RV/HP/UL/01 Riverfront Development	0	75	0	0	22.5	15	11.25	75	48.75	0	0	75	48.75	123.75

		RV/HP/UL/02 Institutional and Industrial Estate Plantations	20.8	20.8	6.24	20.8	10.4	13.52	7.28	62.4	37.44	3.12	3.12	62.4	40.56	102.96
		RV/HP/UL/03 Eco park Development	0	75	0	105	22.5	46.5	32.25	180	101.25	15.75	15.75	180	117	297
Total			**91**	**761.4**	**27.3**	**798**	**246.62**	**405.33**	**273.81**	**1650.4**	**953.06**	**119.7**	**119.7**	**1650.4**	**1072.76**	**2723.16**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 11 (a): Division Wise Proposed Extent for Soil and Moisture Conservation (Area in m^3) for Himachal Pradesh

Sr. No	Division	Cost Model	YEAR						Grand Total Area (m^3)
			Phase I (Extent of Area in m^3)					Phase I	
			I	II	III	IV	V	Total	
			*Estb	Estb	Estb	Estb	Estb	Estb	Estb.
1	Bharmour	RV /HP/ CI/02- Dry Stone Check Dam	4273.50	3374.50	700.00	541.00	200.00	9089.00	9089.00
		RV /HP/ CI/03- Crate Wire Structure	0	0	4550.00	730.00	800.00	6080.00	6080.00

2	**Chamba**	RV/HP/CI/01- Brushwood Check Dam	4110.00	180.00	1040.00	1680.00	780.00	7790.00	7790.00
		RV /HP/ CI/02- Dry Stone Check Dam	18204.00	18329.50	8220.00	3240.50	5419.00	53413.00	53413.00
		RV /HP/ CI/03- Crate Wire Structure	0	3651.00	8305.50	6650.00	7789.00	26395.50	26395.50
		RV /HP/CI/04- water Pond	0	6210.00	6450.00	5880.00	0	18540.00	18540.00
		RV /HP/ CI/05- Silt Detention Structure	0	240.00	120.00	800.00	0	1160.00	1160.00
3	**Churah**	RV/HP/CI/01- Brushwood Check Dam	3480.00	280.00	1000.00	1730.00	200.00	6690.00	6690.00
		RV /HP/ CI/02- Dry Stone Check Dam	19191.00	18487.00	6705.00	3350.00	4220.00	51953.00	51953.00
		RV /HP/ CI/03- Crate Wire Structure	300.00	4432.00	9707.00	3781.00	4090.00	22310.00	22310.00
		RV /HP/CI/04- water Pond	0	9350.00	6510.00	5220.00	0	21080.00	21080.00
		RV /HP/ CI/05- Silt Detention Structure	0	0	120.00	350.00	0	470.00	470.00

4	**Dalhousie**	RV/HP/CI/01- Brushwood Check Dam	0	0	170.00	0	180	350.00	350.00
		RV /HP/ CI/02- Dry Stone Check Dam	5426.50	4411.50	3546.00	2666.50	2427.50	18478.00	18478.00
		RV /HP/ CI/03- Crate Wire Structure	0	300.00	730.00	2112.00	890.00	4032.00	4032.00
Total			**54985.00**	**69245.5.00**	**57873.50**	**38731.0**	**26995.50**	**247830.50**	**247830.50**

Annexure 11 (b): Division Wise Proposed Cost for Soil and Moisture Conservation (Cost) for Himachal Pradesh

Sr. No	**Division**	**Cost Model**	**YEAR**						**Grand Total (Rs.in Lakhs)**
			Phase I: Year Wise Cost (Rs in Lakhs)					**Total Phase I (Rs.in Lakhs)**	
			I	**II**	**III**	**IV**	**V**	**Total**	
			***Estb**	**Estb**	**Estb**	**Estb**	**Estb**	**Estb**	**Estb.**
1	**Bharmour**	RV /HP/ CI/02- Dry Stone Check Dam	76.92	60.74	12.60	9.74	3.60	163.6	163.6
		RV /HP/ CI/03- Crate Wire Structure	0	0	204.75	32.85	36.00	273.6	273.6
2	**Chamba**	RV/HP/CI/01- Brushwood Check Dam	12.33	0.54	3.12	5.04	2.34	23.37	23.37

		RV /HP/ CI/02- Dry Stone Check Dam	327.67	329.92	147.95	58.33	97.54	961.41	961.41
		RV /HP/ CI/03- Crate Wire Structure	0	164.30	373.75	299.25	350.51	1187.81	1187.81
		RV /HP/CI/04- water Pond	0	21.74	22.58	20.58	0	64.9	64.9
		RV /HP/ CI/05- Silt Detention Structure	0	14.40	7.20	48.00	0	69.6	69.6
3	**Churah**	RV/HP/CI/01- Brushwood Check Dam	10.44	0.83	3.14	5.19	0.6	20.2	20.2
		RV /HP/ CI/02- Dry Stone Check Dam	345.44	332.77	120.69	60.30	75.96	935.16	935.16
		RV /HP/ CI/03- Crate Wire Structure	13.50	199.44	436.87	170.15	184.05	1004.01	1004.01
		RV /HP/CI/04- water Pond	0	32.73	22.79	18.27	0	73.79	73.79
		RV /HP/ CI/05- Silt Detention Structure	0	0	7.0	21.00	0	28	28
4	**Dalhousie**	RV/HP/CI/01- Brushwood Check Dam	0	0	0.51	0	0.54	1.05	1.05
		RV /HP/ CI/02- Dry Stone Check Dam	97.68	79.41	63.83	48.00	43.70	332.62	332.62

		RV /HP/ CI/03-Crate Wire Structure	0	13.50	32.85	95.04	40.05	181.44	181.44
Total			**883.98**	**1250.32**	**1459.63**	**891.74**	**834.89**	**5320.56**	**5320.56**

Annexure 12 (a): Division Wise Proposed Extent (in ha) for Riverine and Riparian Wetland Management and Wildlife Conservation in Himachal Pradesh (with sitename)

Sr. No	Division	Sitenames	YEAR									
			Phase I (Extent of Area in ha)					Phase I		Phase II	Phase I &II	
			I	II		III	IV	V	Total		VI	Total Area ha	
			*Estb	Estb	**Maint	Maint	Maint	Maint	Estb	Maint	Total Maint	Estb	Maint
1	Chamba Wildlife Division	Gamgul Siahbehi Wildlife Sanctuary	0.00	35.00	0.00	35.00	35.00	35.00	35.00	105.00	35.00	35.00	35.00
		Kalatop Wildlife Sanctuary	10.0	0.00	10.0	10.00	10.00	10.00	10.00	40.00	0.00	10.00	10.00
		Khajjiar Wildlife Sanctuary	30.0	0.00	30.0	30.00	30.00	30.00	30.00	120.00	0.00	30.00	30.00
		Kugti Wildlife Sanctuary	0.00	60.00	0.00	60.00	60.00	60.00	60.00	180.00	60.00	60.00	60.00

		Manimahesh Wetland	0.00	23.00	0.00	23.00	23.00	23.00	23.00	69.00	23.00	23.00	23.00
		Tundah Wildlife Sanctuary	0.00	30.00	0.00	30.00	30.00	30.00	30.00	90.00	30.00	30.00	30.00
2	Hamirpur Wildlife Division	DhauladharWildlife Sanctuary	0.00	100.00	0.00	100.00	100.00	100.00	100.00	300.00	100.00	100.00	100.00
Total			**40.0**	**248.00**	**40.0**	**288.00**	**288.00**	**288.00**	**288.00**	**904.00**	**248.00**	**288.00**	**288.00**

*****The area shown is virtually for calculation of Budget part. However actual creation of plantation work will start from 3rd year onwards. *Est.=Establishment; and **Maint.=Maintenance

Annexure 12 (b): Division Wise Projected Cost (Rs. in Lakhs) for Riverine and Riparian Wetland Management and Wildlife Conservation in Himachal Pradesh (with sitename)

Sr. No	Division	Sitenames	Phase I: Year Wise Cost (Rs in Lakhs)						Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
			I	II		III	IV	V			VI Year				
			*Estb	Estb	**Maint	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Chamba Wildlife Division	Gamgul SiahbehiWildlife Sanctuary	0.00	112.00	0.00	98.00	66.50	42.00	112.00	206.50	31.50	31.50	112.00	238.00	350.00

		Kalatop Wildlife Sanctuary	32.00	0.00	28.00	19.00	12.00	9.00	32.00	68.00	0.00	0.00	32.00	68.00	100.00
		Khajjiar Wildlife Sanctuary	84.00	0.00	75.00	48.00	36.00	27.00	84.00	186.00	0.00	0.00	84.00	186.00	270.00
		Kugti Wildlife Sanctuary	0.00	192.00	0.00	168.00	114.00	72.00	192.00	354.00	54.00	54.00	192.00	408.00	600.00
		Manimahesh Wetland	0.00	64.40	0.00	57.50	36.80	27.60	64.40	121.90	20.70	20.70	64.40	142.60	207.00
		Tundah Wildlife Sanctuary	0.00	96.00	0.00	84.00	57.00	36.00	96.00	177.00	27.00	27.00	96.00	204.00	300.00
2	Hamirpur Wildlife Division	DhauladharWildlife Sanctuary	0.00	320.00	0.00	280.00	190.00	120.00	320.00	590.00	90.00	90.00	320.00	680.00	1000.00
Total			**116.00**	**784.40**	**103.0**	**754.50**	**512.30**	**333.60**	**900.40**	**1703.40**	**223.20**	**223.20**	**900.40**	**1926.60**	**2827.00**

*Est. = Establishment; and **Maint.=Maintenance

Annexure 13 (a): Division Wise Projected Extent of Plantations in Natural Landscapes in Jammu & Kashmir except for Protection of Forest Fire and Natural Regeneration in Jammu & Kashmir UT (with sitename)

Sr. No.	**Division**	**Site names**	**Year**								**Year**						**Grand Total**	
			Phase I						**Phase I**		**Phase II**							
			(Extent in ha)						**Total (Extent in ha)**		**(Extent in ha)**					**Total (ha)**	**(Ha)**	**(Ha)**
			I	**II**	**III**	**IV**	**V**				**VI**	**VII**	**VIII**	**IX**				
			Est*	**Est***	**Est**	**Est**	**Est**	***Maint**	**Est**	**Maint**	**Maint**	**Maint**	**Maint**	**Mait**	**Maint**	**Maint**	**Est**	**Maint**

1	**Basohli**	Madla comp 22/Bsl	0	0	0	0	0	20	0	20	0	20	20	20	20	20	20	20
2	**Billawar**	Dull 22/BLR	0	11	0	11	0	0	11	11	11	11	11	11	0	11	11	11
		Khudal Co. 9/BLR	0	0	0	0	0	23	0	23	0	23	23	23	23	23	23	23
		Rehan Co. 37/BLR	0	0	0	0	0	20	0	20	0	20	20	20	20	20	20	20
		Salore	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Shuara, Co 16 b/RKT, Lakhri Beat	0	0	0	0	0	20	0	20	0	20	20	20	20	20	20	20
		DrudiGarh-I Beat, Co.22 / RKT	0	10	0	10	0	0	10	10	10	10	10	10	0	10	10	10
		Tardal, Rajwalta beat, Co. No. 10/RKT	0	0	0	0	0	5	0	5	0	5	5	5	5	5	5	5

3	**Kathua**	Co- 30 k, Baba Naal	31	0	31	0	31	0	31	31	31	31	31	0	0	31	31	31
		Co-21k, Kanara	0	25	0	25	0	0	25	25	25	25	25	25	0	25	25	25
		Co-3k, BindalNaal	0	0	0	0	0	10	0	10	0	10	10	10	10	10	10	10
		MalniNalla Bera-1, 83 J	0	0	0	0	0	15	0	15	0	15	15	15	15	15	15	15
		SaitNallah 49 J, Khair Beat	0	0	0	0	0	10	0	10	0	10	10	10	10	10	10	10
		Ujh, ThallaNallah, Co-26 J	0	20	0	20	0	0	20	20	20	20	20	20	0	20	20	20
4	**Samba**	Dhruie Beat	15	0	15	0	15	0	15	15	15	15	15	0	0	15	15	15
		Forest Nursery Blode	0	0	0	0	0	5	0	5	0	5	5	5	5	5	5	5
Total			**46**	**66**	**46**	**66**	**46**	**128**	**112**	**240**	**112**	**240**	**240**	**194**	**128**	**240**	**240**	**240**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 13 (b): Diision Wise Projected Cost of Plantations in Natural Landscapes in Jammu & Kashmir except for Protection of Forest Fire and Natural Regeneration in Jammu & Kashmir UT

Sr No	Division	Sitename	Year									Year							
			Phase I							Phase I		Phase II							
			(Rs.in Lakhs)							(Rs. in Lakhs)		(Rs. in Lakhs)					Grand Total		
			I	II	III	IV		V		Total		VI	VII	VIII	IX	Total	Rs. In lakhs		
			*Est	Est	Est	Est	**Maint	Est	Maint	Est	Maint	Maint	Maint	Maint	Maint	Maint	Est	Maint	Total Cost
1	Basohli	Madla comp 22/Bsl	0.0	0.0	2.4	26.28	0.0	6.45	0.0	35.12	0.0	4.69	4.09	3.45	2.43	14.66	35.12	14.66	49.78
2	Billawar	Dull 22/BLR	0.0	2.1	15.3	5.4	0.0	0.0	3.2	22.7	3.2	2.6	2.1	1.3	0.0	6.05	22.7	9.2	32.18
		Khudal Co. 9/BLR	0.0	0.0	2.41	30.16	0.0	8.5	0.0	41.24	0.0	5.7	5.0	4.2	2.87	17.74	41.24	17.7	59.30
		Rehan Co. 37/BLR	0.0	0.0	2.74	26.3	0.0	6.5	0.0	35.1	0.0	4.7	4.1	3.44	2.4	14.66	35.1	14.7	49.4
		Salore	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0
		Shuara, Co 16 b/RKT, Lakhri Beat	0.0	0.0	2.4	26.3	0.0	6.37	0.0	35.5	0.0	4.7	4.29	3.5	2.4	14.66	35.5	14.65	49.8
		DrudiGarh-I Beat, Co.22 / RKT	0.0	1.17	13.1	3.7	0.0	0.0	2.48	18.0	2.48	2.17	1.6	1.2	0.0	5.21	18.0	7.7	25.8

		Tardal, Rajwalta beat, Co. No. 10/RKT	0.0	0.0	0.6	6.6	0.0	1.9	0.0	9.0	0.0	1.3	1.1	0.9	0.6	3.85	9.0	3.9	12.9
3	Kathua	Co- 30 k, Baba Naal	10.96	36.14	12.5	0.0	6.57	0.0	5.9	59.67	12.40	5	3.8	0.0	0.0	8.87	59.67	21.3	80.9
		Co-21k, Kanara	0.0	3.0	32.9	8.01	0.0	0.0	5.9	43.9	5.9	5.28	4.3	3.0	0.0	12.47	43.9	18.4	62.2
		Co-3k, BindalNaal	0.0	0.0	3.5	11.7	0.0	4.09	0.0	19.2	0.01	2.1	1.9	1.7	1.2	6.88	19.2	6.9	26.2
		MalniNalla Bera-1, 83 J	0.0	0.0	1.8	19.7	0.0	4.8	0.0	26.3	0.0	3.5	3.1	2.6	1.8	10.99	26.3	10.99	37.3
		SaitNallah 49 J, Khair Beat	0.0	0.0	1.17	13.1	0.0	3.2	0.0	17.6	0.0	2.3	2.0	1.7	1.25	7.33	17.6	7.23	24.9
		Ujh, ThallaNallah, Co-26 J	0.0	2.4	26.3	6.5	0.0	0.0	4.64	35.1	4.7	4.1	3.45	2.43	0.0	9.97	35.1	14.7	49.8
4	Samba	DhruieBeat	4.85	17.21	4.85	0.0	2.62	0.0	2.43	26.9	5.05	2.11	1.77	0.0	0.0	4.04	26.9	9.1	36.0
		Forest Nursery Blode	0.0	0.0	1.8	5.82	0.0	2.02	0.0	9.66	0.0	1.16	1.0	0.82	0.61	3.44	9.66	3.43	13.09
Total			**15.81**	**62.02**	**123.77**	**189.57**	**9.19**	**43.83**	**24.55**	**434.99**	**33.74**	**51.41**	**43.6**	**30.25**	**15.56**	**140.82**	**434.99**	**174.56**	**609.55**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 14 (a): Division Wise Proposed Extent of Plantations in Natural Landscapes for Protection of Forest Fire and Natural Regeneration in Jammu & Kashmir UT

Sr. No	Division	Cost Model	YEAR										
			Phase I (Extent of Area in ha)						Phase I		Phase II	Phase I &II	
			I	II		III	IV	V	Total		VI	Total Area ha	
			*Estb	Estb	**Maint	Maint	Maint	Maint	Estb	Maint	Total Maint	Estb	Maint
1	Basohli	RV/JK/NL/11 Protection Model for Natural Regeneration	60.00	0.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00
		RV/JK/NL/12 Fire Protection Model	50.00	0.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
2	Bilawar	RV/JK/NL/11 Protection Model for Natural Regeneration	70.00	0.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00
		RV/JK/NL/12 Fire Protection Model	50.00	0.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
3	Kathua	RV/JK/NL/11 Protection Model for Natural Regeneration	80.00	0.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00
		RV/JK/NL/12 Fire Protection Model	50.00	0.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00

4	**Ramnagar**	RV/JK/NL/11 Protection Model for Natural Regeneration	30.00	30.00	30.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00
		RV/JK/NL/12 Fire Protection Model	20.00	0.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
5	**Samba**	RV/JK/NL/11 Protection Model for Natural Regeneration	30.00	0.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
		RV/JK/NL/12 Fire Protection Model	20.00	0.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Total			**460.00**	**30.00**	**460.00**	**490.00**	**490.00**	**490.00**	**490.00**	**490.00**	**490.00**	**490.00**	**490.00**

*****The area shown is virtually for calculation of Budget part. However actual creation of plantation work will start from 3rd year onwards.

*Est.=Establishment; and **Maint.=Maintenance

Annexure 14 (b): Division Wise Proposed Cost of Plantations in Natural Landscapes for Protection of Forest Fire and Natural Regeneration in Jammu & Kashmir UT

Sr. No	Division	Cost Models	Phase I: Year Wise Cost (Rs in Lakhs)							Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
			I	II		III		IV	V			VI Year				
			*Estb	Estb	**Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Basohli	RV/JK/NL/11 Protection Model for Natural Regeneration	66.43	0.00	6.57		6.92	7.17	7.29	66.43	27.95	0	0	66.43	27.95	94.38
		RV/JK/NL/12 Fire Protection Model	12.23	0.00	5.06		4.84	4.56	4.23	12.23	18.69	0	0	12.23	18.69	30.92
2	Bilawar	RV/JK/NL/11 Protection Model for Natural Regeneration	77.50	0.00	7.67		8.07	8.37	8.51	77.50	32.62	0	0	77.50	32.62	110.12

		RV/JK/NL/12 Fire Protection Model	12.23	0.00	5.06		4.84	4.56	4.23	12.23	18.69	0	0	12.23	18.69	30.92
3	**Kathua**	RV/JK/NL/11 Protection Model for Natural Regeneration	88.58	0.00	8.76		9.23	9.56	9.72	88.58	37.27	0	0	88.58	37.27	125.85
		RV/JK/NL/12 Fire Protection Model	12.23	0.00	5.06		4.84	4.56	4.23	12.23	18.69	0	0	12.23	18.69	30.92
4	**Ramnagar**	RV/JK/NL/11 Protection Model for Natural Regeneration	33.22	33.22	3.29		6.75	7.05	7.24	66.44	24.33	3.65	3.65	66.44	27.98	94.42
		RV/JK/NL/12 Fire Protection Model	4.89	0.00	2.02		1.93	1.83	1.69	4.89	7.47	0	0	4.89	7.47	12.36
5	**Samba**	RV/JK/NL/11 Protection Model for Natural	33.22	0.00	3.29		3.46	3.59	3.65	33.22	13.99	0	0	33.22	13.99	47.21

		Regeneration														
		RV/JK/NL/12 Fire Protection Model	4.89	0.00	2.02		1.93	1.83	1.69	4.89	7.47	0	0	4.89	7.47	12.36
Total			**345.42**	**33.22**	**48.80**		**52.81**	**53.08**	**52.48**	**378.64**	**207.17**	**3.65**	**3.65**	**378.64**	**210.82**	**589.46**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 15 (a): Division Wise Proposed Extent of Plantations in Agriculture Landscapes in Jammu & Kashmir UT

Sr No	Division	Cost Model	YEAR											Grand Total Area (ha)	
			Phase I (Extent of Area in ha)							Phase I		Phase II			
			I	II		III		IV	V	Total		VI	Total		
			*Estb	Estb	**Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Total	Estb.	Maint
1	Basohli	RV/JK/AL/01 - Boundary Plantation Model	10.00	20.00	10.00	15.00	30.00	45.00	35.00	45.00	45.00	15.00	15.00	45.00	45.00
		RV /JK/AL/02 Planting of	2.00	3.00	2.00	3.00	5.00	8.00	6.00	8.00	8.00	3.00	3.00	8.00	8.00

		Economic Trees in Block Plantation													
2	**Bilawar**	RV/JK/AL/01 - Boundary Plantation Model	15.00	10.00	15.00	15.00	25.00	40.00	25.00	40.00	40.00	15.00	15.00	40.00	40.00
		RV /JK/AL/02 Planting of Economic Trees in Block Plantation	3.00	2.00	3.00	3.00	5.00	8.00	5.00	8.00	8.00	3.00	3.00	8.00	8.00
3	**Kathua**	RV/JK/AL/01 - Boundary Plantation Model	12.00	15.00	12.00	15.00	27.00	42.00	30.00	42.00	42.00	15.00	15.00	42.00	42.00
		RV /JK/AL/02 Planting of Economic Trees in Block Plantation	2.00	3.00	2.00	3.00	5.00	8.00	6.00	8.00	8.00	3.00	3.00	8.00	8.00

4	**Ramnagar**	RV/JK/AL/01 - Boundary Plantation Model	20.00	10.00	20.00	15.00	30.00	45.00	25.00	45.00	45.00	15.00	15.00	45.00	45.00
		RV /JK/AL/02 Planting of Economic Trees in Block Plantation	3.00	2.00	3.00	2.00	5.00	7.00	4.00	7.00	7.00	2.00	2.00	7.00	7.00
5	**Samba**	RV/JK/AL/01 - Boundary Plantation Model	10.00	10.00	10.00	15.00	20.00	35.00	25.00	35.00	35.00	15.00	15.00	35.00	35.00
		RV /JK/AL/02 Planting of Economic Trees in Block Plantation	3.00	2.00	3.00	2.00	5.00	7.00	4.00	7.00	7.00	2.00	2.00	7.00	7.00
Total			**80.00**	**77.00**	**80.00**	**88.00**	**157.00**	**245.00**	**165.00**	**245.00**	**245.00**	**88.00**	**88.00**	**245.00**	**245.00**

*Est. = Establishment; and **Maint.=Maintenance

Annexure 15 (b): Division Wise Projected Cost of Plantations in Agriculture Landscapes in Jammu & Kashmir UT

Sr. No	Division	Cost Models	Phase I: Year Wise Cost (Rs in Lakhs)							Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
			I	II		III		IV	V			VI Year				
			*Estb	Estb	**Main	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Basohli	RV/JK/AL/01 Boundary Plantation Model	0.90	1.80	0.48	1.35	1.51	2.41	2.01	4.05	6.41	0.88	0.88	4.05	7.29	11.34
		RV /JK/AL/02 Planting of Economic Trees in Block Plantation	0.96	1.44	0.51	1.44	1.32	2.18	1.70	3.84	5.71	0.88	0.88	3.84	6.59	10.43
2	Bilawar	RV/JK/AL/01 Boundary Plantation Model	1.35	0.90	0.72	1.35	1.31	2.15	1.42	3.60	5.60	0.88	0.88	3.60	6.48	10.08

		RV /JK/AL/02 Planting of Economic Trees in Block Plantation	1.44	0.96	0.77	1.44	1.33	2.20	1.41	3.84	5.71	0.88	0.88	3.84	6.59	10.43
3	**Kathua**	RV/JK/AL/01 Boundary Plantation Model	1.08	1.35	0.58	1.35	1.38	2.26	1.71	3.78	5.93	0.88	0.88	3.78	6.81	10.59
		RV /JK/AL/02 Planting of Economic Trees in Block Plantation	0.96	1.44	0.51	1.44	1.32	2.18	1.70	3.84	5.71	0.88	0.88	3.84	6.59	10.43
4	**Ramnagar**	RV/JK/AL/01 Boundary Plantation Model	1.80	0.90	0.96	1.35	1.58	2.45	1.42	4.05	6.41	0.88	0.88	4.05	7.29	11.34
		RV /JK/AL/02 Planting of Economic Trees in Block Plantation	1.44	0.96	0.77	0.96	1.33	1.94	1.14	3.36	5.18	0.59	0.59	3.36	5.77	9.13
5	**Samba**	RV/JK/AL/01 Boundary Plantation Model	0.90	0.90	0.48	1.35	1.03	1.86	1.42	3.15	4.79	0.88	0.88	3.15	5.67	8.82

		RV /JK/AL/02 Planting of Economic Trees in Block Plantation	1.44	0.96	0.77	0.96	1.33	1.94	1.14	3.36	5.18	0.59	0.59	3.36	5.77	9.13
Total			**12.27**	**11.61**	**6.55**	**12.99**	**13.44**	**21.57**	**15.07**	**36.87**	**56.63**	**8.22**	**8.22**	**36.87**	**64.85**	**101.72**

*Est .= Establishment; and **Maint.=Maintenance

Annexure 16 (a): Division Wise Proposed Extent of Plantations in Urban Landscapes in Jammu & Kashmir UT

Sr. No	Division	Cost Model	YEAR											Grand Total Area (ha)	
			Phase I (Extent of Area in ha)							Phase I		Phase II			
			I	II		III		IV	V	Total		VI	Total		
			*Estb	Estb	** Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Total	Estb.	Maint
1	Basholi	RV/JK/UL/02 Institutional and Industrial Estate Plantations	5.00	8.00	5.00	8.00	13.00	21.00	16.00	21.00	21.00	8.00	8.00	21.00	21.00
		RV/JK/UL/03 Eco park Development	0.00	1.50	0.00	0.00	1.50	1.50	1.50	1.50	1.50	0.00	0.00	1.50	1.50

2	**Bilawar**	RV/JK/UL/02 Institutional and Industrial Estate Plantations	6.00	6.49	6.00	8.00	12.49	20.49	14.49	20.49	20.49	8.00	8.00	20.49	20.49
		RV/JK/UL/03 Eco park Development	0.00	2.30	0.00	0.40	2.30	2.70	2.70	2.70	2.70	0.40	0.40	2.70	2.70
3	**Kathua**	RV/JK/UL/02 Institutional and Industrial Estate Plantations	8.00	8.00	8.00	9.00	16.00	25.00	17.00	25.00	25.00	9.00	9.00	25.00	25.00
4	**Ramnagar**	RV/JK/UL/02 Institutional and Industrial Estate Plantations	6.00	9.00	6.00	10.00	15.00	25.00	19.00	25.00	25.00	10.00	10.00	25.00	25.00
5	**Samba**	RV/JK/UL/02 Institutional and Industrial Estate Plantations	8.00	11.00	8.00	11.00	19.00	30.00	22.00	30.00	30.00	11.00	11.00	30.00	30.00
		RV/JK/UL/03 Eco park Development	0.00	0.90	0.00	0.00	0.90	0.90	0.90	0.90	0.90	0.00	0.00	0.90	0.90
Total			**33.00**	**47.19**	**33.00**	**46.40**	**80.19**	**126.59**	**93.59**	**126.59**	**126.59**	**46.40**	**46.40**	**126.59**	**126.59**

*Est.=Establishment; and **maint.=Maintenance

Annexure 16 (b): Division Wise Proposed Cost of Plantations in Urban Landscapes in Jammu & Kashmir UT

Sr. No	Division	Cost Models	Phase I: Year Wise Cost (Rs in Lakhs)							Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
			I	II		III		IV	V			VI Year				
			*Estb	Estb	**Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Basholi	RV/JK/UL/02 Institutional and Industrial Estate Plantations	13.00	20.80	3.90	20.80	8.84	12.35	7.28	54.60	32.37	3.12	3.12	54.60	35.49	90.09
		RV/JK/UL/03 Eco park Development	0.00	225.00	0.00	0.00	67.50	45.00	33.75	225.00	146.25	0.00	0.00	225.00	146.25	371.25
2	Bilawar	RV/JK/UL/02 Institutional and Industrial Estate Plantations	15.60	16.87	4.68	20.80	8.18	11.95	6.69	53.27	31.50	3.12	3.12	53.27	34.62	87.89
		RV/JK/UL/03 Eco park Development	0.00	345.00	0.00	60.00	103.50	87.00	63.75	405.00	254.25	9.00	9.00	405.00	263.25	668.25
3	Kathua	RV/JK/UL/02 Institutional and Industrial Estate Plantations	20.80	20.80	6.24	23.40	10.40	14.30	7.80	65.00	38.74	3.51	3.51	65.00	42.25	107.25

4	**Ramnagar**	RV/JK/UL/02 Institutional and Industrial Estate Plantations	15.60	23.40	4.68	26.00	10.14	14.82	8.71	65.00	38.35	3.90	3.90	65.00	42.25	107.25
5	**Samba**	RV/JK/UL/02 Institutional and Industrial Estate Plantations	20.80	28.60	6.24	28.60	12.74	17.42	10.01	78.00	46.41	4.29	4.29	78.00	50.7	128.70
		RV/JK/UL/03 Eco park Development	0.00	135.00	0.00	0.00	40.50	27.00	20.25	135.00	87.75	0.00	0.00	135.00	87.75	222.75
Total			**85.80**	**815.47**	**25.74**	**179.60**	**261.80**	**229.84**	**158.24**	**1080.87**	**675.62**	**26.94**	**26.94**	**1080.87**	**702.56**	**1783.43**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 17(a): Division Wise Proposed Extent for Soil and Moisture Conservation (Area in m3) for Jammu & Kashmir UT

Sr. No	Division	Cost Model	YEAR						Grand Total Area (m^3)
			Phase I (Extent of Area in m^3)					Phase I	
			I	II	III	IV	V	Total	
			*Estb	Estb	Estb	Estb	Estb	Estb	Estb.
1	**Basholi**	RV /JK/ CI/02- Dry Stone Check Dam	200.00	0.00	0.00	0.00	0.00	200.00	200.00

		RV /JK/ CI/03- Crate Wire Structure	0.00	250.00	0.00	0.00	0.00	250.00	250.00
2	**Bilawar**	RV /JK/ CI/02- Dry Stone Check Dam	200.00	700.00	150.00	0.00	0.00	1050.00	1050.00
		RV /JK/ CI/03- Crate Wire Structure	1180.00	0.00	300.00	450.00	0.00	1930.00	1930.00
3	**Kathua**	RV /JK/ CI/02- Dry Stone Check Dam	4650.00	3110.00	1320.00	0.00	280.00	9360.00	9360.00
		RV /JK/ CI/03- Crate Wire Structure	900.00	1750.00	1440.00	810.00	0.00	4900.00	4900.00
4	**Samba**	RV /JK/ CI/02- Dry Stone Check Dam	200.00	0.00	0.00	0.00	0.00	200.00	200.00
		RV /JK/ CI/03- Crate Wire Structure	1400.00	300.00	0.00	0.00	0.00	1700.00	1700.00
Total			**8330.00**	**6110.0**	**3210.0**	**1260.0**	**280.00**	**19590.00**	**19590.0**

*Est.=Establishment

Annexure 17 (b): Division Wise Proposed Extent for Soil and Moisture Conservation (Cost) for Jammu & Kashmir UT

Sr. No	Division	Cost Model	YEAR						Grand Total (Rs.in Lakhs)
			Phase I: Year Wise Cost (Rs in Lakhs)					Total Phase I (Rs.in Lakhs)	
			I	II	III	IV	V	Total	
			*Estb	Estb	Estb	Estb	Estb	Estb	Estb.
1	Basholi	RV /JK/ CI/02- Dry Stone Check Dam	3.60	0.00	0.00	0.00	0.00	3.60	3.60
		RV /JK/ CI/03- Crate Wire Structure	0.00	11.25	0.00	0.00	0.00	11.25	11.25
2	Bilawar	RV /JK/ CI/02- Dry Stone Check Dam	3.60	12.60	2.70	0.00	0.00	18.90	18.90
		RV /JK/ CI/03- Crate Wire Structure	53.10	0.00	13.50	20.25	0.00	86.85	86.85
3	Kathua	RV /JK/ CI/02- Dry Stone Check Dam	83.70	55.98	23.76	0.00	5.04	168.48	168.48
		RV /JK/ CI/03- Crate Wire Structure	40.50	78.75	64.80	36.45	0.00	220.50	220.50
4	Samba	RV /JK/ CI/02- Dry Stone Check Dam	3.60	0.00	0.00	0.00	0.00	3.60	3.60

		RV /JK/ CI/03-Crate Wire Structure	63.00	13.50	0.00	0.00	0.00	76.50	76.50
Total			**243.90**	**172.08**	**104.76**	**56.70**	**5.04**	**589.68**	**589.68**

*Est.=Establishment

Annexure 18 (a): Division Wise Proposed Extent (in ha) for Riverine and Riparian Wetland Management and Wildlife Conservation in Jammu & Kashmir UT (with sitename)

Sr.No.	Division	Sitnames	Year								Year		Grand Total	
			Phase I							Phase I	Phase II			
			(Extent in ha)							Total(Extent in ha)	(Extent in ha)	Total (ha)	(Ha)	(Ha)
			I	II	III	IV		V			VI			
			Est*	Est	Est	Est	**Maint	Maint	Maint	Maint	Maint	Maint	Maint	Maint
1	Kathua WL	Jasrota Wildlife Sanctuary	0	60	20	0	20	0	20	20	60	20	20	20	20
Total			**0**	**60**	**20**	**0**	**20**	**0**	**20**	**20**	**60**	**20**	**20**	**20**	**20**

*****The area shown is virtually for calculation of Budget part. However actual creation of plantation work will start from 3rd year onwards.

*Est.=Establishment; and **Maint.=Maintenance

Annexure 18 (b): Division Wise Projected Cost (Rs. in Lakhs) for Riverine and Riparian Wetland Management and Wildlife Conservation in Jammu & Kashmir UT (with sitename)

Sr. No	Division		Year							Year				
			Phase I						Phase I	Phase II				
			(Rs.in Lakhs)						(Rs. in Lakhs)	(Rs. in Lakhs)		Grand Total		
			I	II	III	IV		V	Total		VI	Total	Rs. In lakhs	
			Est	Est	Est	Est	Maint	Est	Maint	Est	Maint	Maint	Maint	Est	Maint	Total Cost
1	Kathua WL	Jasrota Wildlife Sanctuary	0	64	20	0	38	0	24	64	118	18	18	64	136	200
Total			**0**	**64**	**20**	**0**	**38**	**0**	**24**	**64**	**118**	**18**	**18**	**64**	**136**	**200**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 19 (a): Division Wise Proposed Extent of Plantations in Natural Landscapes in Punjab except for Protection of Forest Fire and Natural Regeneration in Punjab

Sr. No	Division	sitename	YEAR													
			Phase I (Extent of Area in ha)						Phase I		Phase II			Phase II	Phase I &II	
			I	II		III		IV	V	Total		VI	VII	VII I		Total Area ha	
			*Estb	Estb	** Maint	Maint	Estb	Maint	Maint	Estb	Maint	Maint	Maint	Maint	Total Maint	Estb	Maint
1	Amritsar	BhindiAulakh	8	0	8	0	8	0	8	8	8	8	0	0	8	8	8
		Ghoga	9	0	9	0	9	0	9	9	9	9	0	0	9	9	9
		Gulgarh	8	0	8	0	8	0	8	8	8	8	0	0	8	8	8
		Hashampura	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6
		JagdevKhurd	7	0	7	0	7	0	7	7	7	7	0	0	7	7	7
		JagdevKhurd	5	0	5	0	5	0	5	5	5	5	0	0	5	5	5
		Jhunj	9	0	9	0	9	0	9	9	9	9	0	0	9	9	9
		Kohali	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6
		Ramdas	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6
		Sarangdev	5	0	5	0	5	0	5	5	5	5	0	0	5	5	5
2	Gurdas-pur	Adi Bandh 0 to 9.5	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
		Ali Nangal	40	0	40	0	40	0	40	40	40	40	0	0	40	40	40
		Batala Bus Stand to Misharpur	0	8	0	8	0	0	8	8	8	8	8	0	8	8	8
		Batala to Khanuwan	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6

	road 0-4 B/S															
	Batala to Qadian road	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
	Baupu Band	0	7	0	7	0	0	7	7	7	7	7	0	7	7	7
	BaupurAfgana to NurpurThel	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
	BaupurJattan	0	5	0	5	0	0	5	5	5	5	5	0	5	5	5
	Chakraja	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
	Chauntra, Dinanagar	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6
	Chitti	5	0	5	0	5	0	5	5	5	5	0	0	5	5	5
	Chourakalan	5	0	5	0	5	0	5	5	5	5	0	0	5	5	5
	Dharamkot Randhawa to Ravi Dasya	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
	Dharamkot to Shampur Road	0	8	0	8	0	0	8	8	8	8	8	0	8	8	8
	Dher	8	0	8	0	8	0	8	8	8	8	0	0	8	8	8
	Dinanagarawa raness park	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
	Dinanagar to Taragarh road Km 0 to 5 B/S	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
	Dinanagar to Taragarh road to village Bharth road	0	8	0	8	0	0	8	8	8	8	8	0	8	8	8
	Dorangla	5	0	5	0	5	0	5	5	5	5	0	0	5	5	5
	Dugri	7	0	7	0	7	0	7	7	7	7	0	0	7	7	7
	Faridpur	8	0	8	0	8	0	8	8	8	8	0	0	8	8	8

G.P BohalWadala	5	0	5	0	5	0	5	5	5	5	0	0	5	5	5
G.P chanduWadcela	5	0	5	0	5	0	5	5	5	5	0	0	5	5	5
G.P Chorakalan	8	0	8	0	8	0	8	8	8	8	0	0	8	8	8
G.P Monanpur	7	0	7	0	7	0	7	7	7	7	0	0	7	7	7
G.P Rodana	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6
G.P Rosa	7	0	7	0	7	0	7	7	7	7	0	0	7	7	7
G.P Shuhar Kalan	5	0	5	0	5	0	5	5	5	5	0	0	5	5	5
G.P Shuhar Kalan	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6
G.P. Jhabkara	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6
G.P. Bahmani	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6
G.P. Bahmani	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6
Gahlri	8	0	8	0	8	0	8	8	8	8	0	0	8	8	8
Galhari	5	0	5	0	5	0	5	5	5	5	0	0	5	5	5
Gola Dhola to Abaad Post	0	8	0	8	0	0	8	8	8	8	8	0	8	8	8
GP Balim	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6
GP BrilanKhurd	5	0	5	0	5	0	5	5	5	5	0	0	5	5	5
GP Dhindowal	5	0	5	0	5	0	5	5	5	5	0	0	5	5	5
GP Gaddian Kalan	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6
GP Marara	5	0	5	0	5	0	5	5	5	5	0	0	5	5	5

GP Masana	7	0	7	0	7	0	7	7	7	7	0	0	7	7	7
Gram panchayat dostpur	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6
II-R Minor (Railway Station to ShehjadaPind)	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
Islampur	10	0	10	0	10	0	10	10	10	10	0	0	10	10	10
Jainpur Band	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
Jhabkra to Tanda Rd b/s	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
Jogar	8	0	8	0	8	0	8	8	8	8	0	0	8	8	8
Kahna	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6
Khushipur	5	0	5	0	5	0	5	5	5	5	0	0	5	5	5
Lallowal	8	0	8	0	8	0	8	8	8	8	0	0	8	8	8
Link Road From DBN Road to Alawazpur	0	8	0	8	0	0	8	8	8	8	8	0	8	8	8
Link Road Shampur to KotGurbaksh	0	8	0	8	0	0	8	8	8	8	8	0	8	8	8
Magar Mudian	0	9	0	9	0	0	9	9	9	9	9	0	9	9	9
MallianFaikhira	0	8	0	8	0	0	8	8	8	8	8	0	8	8	8
Marara to Makro Road	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
Mirjapur	0	9	0	9	0	0	9	9	9	9	9	0	9	9	9
Munjwal	10	0	10	0	10	0	10	10	10	10	0	0	10	10	10

	Jungle															
	Naushehra	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
	Nomni Drain Shahpur Pull to Darmabad village	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
	Pakiwa	0	9	0	9	0	0	9	9	9	9	9	0	9	9	9
	Raduaina to BoharWadal	0	5	0	5	0	0	5	5	5	5	5	0	5	5	5
	RatrarChattar to Dharamkot Randhawa	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
	RattaDistributry	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
	Ravi Dhusi Upper Rd 0-30 B/S	0	5	0	5	0	0	5	5	5	5	5	0	5	5	5
	Ravi Dhusi Upper Rd 0-30 B/S	0	5	0	5	0	0	5	5	5	5	5	0	5	5	5
	Sangor	7	0	7	0	7	0	7	7	7	7	0	0	7	7	7
	Sh. Rampur Block Dorangala	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6
	Sultani	0	9	0	9	0	0	9	9	9	9	9	0	9	9	9
	Tajpur	0	8	0	8	0	0	8	8	8	8	8	0	8	8	8
	TalwandiHinduan	5	0	5	0	5	0	5	5	5	5	0	0	5	5	5
	Tanda Band	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
	Thakarpur Band	0	5	0	5	0	0	5	5	5	5	5	0	5	5	5

		Thathi	0	7	0	7	0	0	7	7	7	7	7	0	7	7	7
		Ugra	0	0.35	0	0.35	0	0	0.35	0.35	0	0.35	0.35	0	0.35	0.35	0.35
		VillAdi to VillAluna	0	5	0	5	0	0	5	5	5	5	5	0	5	5	5
		VillChoura Kalan to ChouraKhurd	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
		VillDorangla Road to VillIslampur Link Road	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
		VillDorangla Road to VillShapur Link road	0	5	0	5	0	0	5	5	5	5	5	0	5	5	5
		Villdorangla Road to villShapur Link road	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
		VillDostpur to BoharWadala	0	5	0	5	0	0	5	5	5	5	5	0	5	5	5
		VillNoushehra to VillIslampur Link Road	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
		VillSangorh to Choundra Road	0	5	0	5	0	0	5	5	5	5	5	0	5	5	5
		Vill-Dostpur to vill-kamalpurJattan	0	6	0	6	0	0	6	6	6	6	6	0	6	6	6
		WazirpurAfga	6	0	6	0	6	0	6	6	6	6	0	0	6	6	6

		na															
3	Pathan-kot	UP & sec-4, (sukretsalai)	0	20	0	20	0	0	20	20	20	20	20	0	20	20	20
		P 11 Bansipur c-1, c-2	20	0	20	0	20	0	20	20	20	20	0	0	20	20	20
		UP & sec-4, Arvelli	0	0	0	0	0	20	0	20	0	20	20	20	20	20	20
		UP & sec-4, charajhikla	0	0	0	0	0	20	0	20	0	20	20	20	20	20	20
		UP & sec-4, Dalla	0	0	0	0	0	20	0	20	0	20	20	20	20	20	20
		UP & sec-4, kot	0	0	0	0	0	20	0	20	0	20	20	20	20	20	20
		UP & sec-4, SukretSalai	0	0	0	0	0	20	0	20	0	20	20	20	20	20	20
		UP & see 4 Matti	0	0	0	0	0	20	0	20	0	20	20	20	20	20	20
Total			**364**	**311.35**	**364**	**311.35**	**364**	**120**	**675.35**	**795.35**	**675**	**795.35**	**431.35**	**120**	**795.35**	**795.35**	**795.35**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 19 (b): Division Wise Proposed Cost of Plantations in Natural Landscapes in Punjab except for Protection of Forest Fire and Natural Regeneration in Punjab

Sr. No	Division	sitename	Year							Year						Total Cost
			Phase I					Phase I		Phase II						
			(Rs.in Lakhs)					(Rs. in Lakhs)		(Rs. in Lakhs)				Grand Total		
			I	II	III	IV	V	Total		VI	VII	VIII	Total	Rs. In lakhs		
			*Establishment	Establishment	Establishment	Establishment	**Maintenanc	Establishment	Maintenance	Establishment	Maintenanc	Maintenanc	Maintenance	Establishment	Maintenanc	
1	Amritsar	BhindiAulakh	3.05	4.19	14.43	0	10.06	0	3.78	21.67	13.83	0.47	0	0	0.47	21.67	14.3	35.97
		Ghoga	3.40	4.71	16.23	0	11.31	0	4.25	24.38	15.56	0.53	0	0	0.53	24.38	16.09	40.47
		Gulgarh	3.05	4.19	14.43	0	10.06	0	3.78	21.67	13.83	0.47	0	0	0.47	21.67	14.3	35.97
		Hashampura	0.97	1.51	6.63	0	3.09	0	1.28	9.1	4.37	0.44	0	0	0.44	9.1	4.81	13.91
		JagdevKhurd	1.13	1.76	7.73	0	3.62	0	1.49	10.61	5.1	0.52	0	0	0.52	10.61	5.62	16.23
		JagdevKhurd	0.81	1.26	5.51	0	2.58	0	1.07	7.58	3.64	0.37	0	0	0.37	7.58	4.01	11.6
		Jhunj	1.45	2.26	9.94	0	4.62	0	1.92	13.65	6.56	0.67	0	0	0.67	13.65	7.23	20.87
		Kohali	0.97	1.51	6.63	0	3.09	0	1.28	9.1	4.37	0.44	0	0	0.44	9.1	4.81	13.91
		Ramdas	0.97	1.51	6.63	0	3.09	0	1.28	9.1	4.12	0.44	0	0	0.44	9.1	4.81	13.93
		Saran-gdev	1.92	2.6	9.02	0	6.29	0	2.36	13.53	8.65	0.29	0	0	0.29	13.53	8.96	22.48
2	Gurdaspur	Adi Bandh 0 to 9.5	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		Ali Nangal	6.45	10.04	44.17	0	20.61	0	8.54	60.66	29.15	2.96	0	0	2.96	60.66	32.11	92.77
		Batala	0	3.05	4.19	14.43	0	0	10.06	21.67	10.06	3.78	0.47	0	4.25	21.67	14.31	35.97

		Bus Stand to Misharpur															
		Batala to Khanuwan road 0-4 B/S	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		Batala to Qadian road	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		Baupu Band	0	1.13	1.76	7.73	0	0	3.61	10.30	3.69	1.49	0.56	0	2.15	10.30	5.62	16.23
		BaupurAfgana to NurpurThel	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		BaupurJattan	0	0.81	1.26	5.52	0	0	2.58	7.01	2.58	1.07	0.37	0	1.44	7.01	4.02	11.60
		Chakraja	0	0.97	1.51	6.63	0	0	3.09	9.1	3.09	1.28	0.48	0	1.72	9.1	4.81	13.91
		Chauntra, Dinanagar	0.87	1.51	6.63	0	3.09	0	1.28	9.1	4.37	0.44	0	0	0.44	9.1	4.81	13.91
		Chitti	0.81	1.26	5.52	0	2.58	0	1.07	7.58	3.64	0.37	0	0	0.37	7.58	4.01	11.69
		Chouraka lan	0.81	1.26	5.52	0	2.58	0	1.07	7.58	3.64	0.37	0	0	0.37	7.58	4.01	11.60
		Dharamkot Randhawa to Ravi Dasya	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		Dharamkot to Shampur Road	0	3.05	4.19	14.43	0	0	10.06	21.67	10.06	3.78	0.47	0	4.25	21.67	14.31	35.97
		Dher	1.29	2.01	8.83	0	4.12	0	1.71	12.13	5.83	0.59	0	0	0.59	12.13	6.42	18.55

		Dinanagarawaranes s park	0	0.97	1.51	6.63	0	0	3.09	9.1	3.09	1.28	0.44	0	1.72	9.1	4.81	13.91
		Dinanagar to Taragarh road Km 0 to 5 B/S	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		Dinanagar to Taragarh road to village Bharth road	0	3.05	4.19	14.43	0	0	10.06	21.67	10.06	3.78	0.47	0	4.25	21.67	14.31	35.97
		Dorangla	0.81	1.26	5.52	0	2.58	0	1.07	7.58	3.64	0.37	0	0	0.37	7.58	4.01	11.60
		Dugri	1.13	1.76	7.73	0	3.61	0	1.49	10.61	5.1	0.52	0	0	0.52	10.61	5.62	16.23
		Faridpur	1.29	2.01	8.83	0	4.12	0	1.71	12.13	5.83	0.59	0	0	0.59	12.13	6.42	18.55
		G.P BohalWadala	0.81	1.26	5.52	0	2.58	0	1.07	7.58	3.64	0.37	0	0	0.37	7.58	4.01	11.60
		G.P chanduWadcela	0.81	1.26	5.52	0	2.58	0	1.07	7.58	3.64	0.37	0	0	0.37	7.58	4.23	11.60
		G.P Chorakalan	1.29	2.01	8.83	0	4.12	0	1.71	12.13	5.83	0.59	0	0	0.59	12.13	6.42	18.55
		G.P Monanpur	1.13	1.76	7.73	0	3.61	0	1.49	10.61	5.1	0.52	0	0	0.52	10.61	5.62	16.23
		G.P Rodana	0.97	1.51	6.63	0	3.09	0	1.28	9.1	4.37	0.44	0	0	0.44	9.1	4.81	13.91
		G.P Rosa	1.13	1.76	7.73	0	3.61	0	1.49	10.61	5.1	0.52	0	0	0.52	10.61	5.62	16.23
		G.P Shuhar Kalan	0.81	1.26	5.52	0	2.58	0	1.07	7.58	3.64	0.37	0	0	0.37	7.58	4.01	11.60

		G.P Shuhar Kalan	0.97	1.51	6.63	0	3.09	0	1.28	9.1	4.37	0.44	0	0	0.44	9.1	4.81	13.91
		G.P. Jhabkara	0.97	1.51	6.63	0	3.09	0	1.28	9.1	4.37	0.44	0	0	0.44	9.1	4.81	13.91
		G.P. Bahmani	0.97	1.51	6.63	0	3.09	0	1.28	9.1	4.37	0.44	0	0	0.44	9.1	4.81	13.91
		G.P. Bahmani	0.97	1.51	6.63	0	3.09	0	1.28	9.1	4.37	0.44	0	0	0.44	9.1	4.81	13.91
		Gahlri	1.29	2.01	8.83	0	4.12	0	1.71	12.13	5.83	0.59	0	0	0.59	12.13	6.42	18.55
		Galhari	0.81	1.26	5.52	0	2.58	0	1.07	7.58	3.64	0.37	0	0	0.37	7.58	4.01	11.60
		Gola Dhola to Abaad Post	0	3.05	4.19	14.43	0	0	10.06	21.67	10.06	3.78	0.47	0	4.25	21.67	14.31	35.97
		GP Balim	0.97	1.51	6.63	0	3.09	0	1.28	9.1	4.37	0.44	0	0	0.44	9.1	4.81	13.91
		GP BrilanKhurd	0.81	1.26	5.52	0	2.58	0	1.07	7.58	3.64	0.37	0	0	0.37	7.58	4.01	11.60
		GP Dhindowal	0.81	1.26	5.52	0	2.58	0	1.07	7.58	3.64	0.37	0	0	0.37	7.58	4.01	11.60
		GP Gaddian Kalan	0.97	1.51	6.63	0	3.09	0	1.28	9.1	4.37	0.44	0	0	0.44	9.1	4.81	13.91
		GP Marara	0.81	1.26	5.52	0	2.58	0	1.07	7.58	3.64	0.37	0	0	0.37	7.58	4.01	11.60
		GP Masana	1.13	1.76	7.73	0	3.61	0	1.49	10.61	5.1	0.52	0	0	0.52	10.61	5.62	16.23
		Gram panchayat dostpur	0.97	1.51	6.63	0	3.09	0	1.28	9.1	4.37	0.44	0	0	0.44	9.1	4.81	13.91
		II-R Minor	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98

		(Railway Station to Shehjada Pind)															
		Islampur	1.61	2.51	11.04	0	5.15	0	2.13	15.16	7.29	0.74	0	0	0.74	15.16	8.03	23.19
		Jainpur Band	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		Jhabkra to Tanda Rd b/s	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		Jogar	1.29	2.01	8.83	0	4.12	0	1.71	12.13	5.83	0.59	0	0	0.59	12.13	6.42	18.55
		Kahna	0.97	1.51	6.63	0	3.09	0	1.28	9.1	4.37	0.44	0	0	0.44	9.1	4.81	13.91
		Khushipur	0.81	1.26	5.52	0	2.58	0	1.07	7.58	3.64	0.37	0	0	0.37	7.58	4.01	11.60
		Lallowal	1.29	2.01	8.83	0	4.12	0	1.71	12.13	5.83	0.59	0	0	0.59	12.13	6.42	18.55
		Link Road From DBN Road to Alawazpur	0	3.05	4.19	14.43	0	0	10.06	21.67	10.06	3.78	0.47	0	4.25	21.67	14.31	35.97
		Link Road Shampur to KotGurbaksh	0	3.05	4.19	14.43	0	0	10.06	21.67	10.06	3.78	0.47	0	4.25	21.67	14.31	35.97
		Magar Mudian	0	1.45	2.26	9.94	0	0	4.64	13.65	4.64	1.92	0.67	0	2.59	13.65	7.23	20.87
		MallianFaikhira	0	3.05	4.19	14.43	0	0	10.06	21.67	10.06	3.78	0.47	0	4.25	21.67	14.31	35.97
		Marara to Makro Road	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		Mirjapur	0	1.45	2.26	9.94	0	0	4.64	13.65	4.64	1.92	0.67	0	2.59	13.65	7.23	20.87

		Munjwal Jungle	1.61	2.51	11.04	0	5.15	0	2.13	15.16	7.29	0.74	0	0	0.74	15.16	8.03	23.19
		Naushehra	0	0.97	1.51	6.63	0	0	3.09	9.1	3.09	1.28	0.44	0	1.72	9.1	4.81	13.91
		Nomni Drain Shahpur Pull to Darmabad village	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		Pakiwa	0	1.45	2.26	9.94	0	0	4.64	13.65	4.64	1.92	0.67	0	2.59	13.65	7.23	20.87
		Raduaina to BoharWadal	0	1.91	2.62	9.02	0	0	6.29	13.54	6.29	2.36	0.29	0	2.65	13.54	8.94	22.48
		RatrarChattar to Dharamkot Randhawa	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		RattaDistributry	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		Ravi Dhusi Upper Rd 0-30 B/S	0	1.91	2.62	9.02	0	0	6.29	13.54	6.29	2.36	0.29	0	2.65	13.54	8.94	22.48
		Ravi Dhusi Upper Rd 0-30 B/S	0	1.91	2.62	9.02	0	0	6.29	13.48	6.29	2.36	0.29	0	2.65	13.48	8.94	22.48
		Sangor	1.13	1.76	7.73	0	3.61	0	1.49	10.61	5.1	0.52	0	0	0.52	10.61	5.62	16.23
		Sh. Rampur Block Dorangala	0.97	1.51	6.63	0	3.09	0	1.28	9.1	4.37	0.44	0	0	0.44	9.1	4.81	13.91

		Sultani	0	1.45	2.26	9.94	0	0	4.64	13.65	4.64	1.92	0.67	0	2.59	13.65	7.23	20.87
		Tajpur	0	1.29	2.01	8.83	0	0	4.12	12.13	4.12	1.71	0.59	0	2.3	12.13	6.42	18.55
		Talwandi Hinduan	0.81	1.26	5.52	0	2.58	0	1.05	7.58	3.64	0.37	0	0	0.37	7.58	4.01	11.60
		Tanda Band	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		Thakarpur Band	0	1.91	2.62	9.02	0	0	6.29	13.54	6.29	2.36	0.29	0	2.65	13.54	8.94	22.48
		Thathi	0	1.13	1.76	7.73	0	0	3.61	10.61	3.61	1.49	0.52	0	2.01	10.61	5.62	16.23
		Ugra	0	0.06	0.05	0.39	0	0	0.18	0.54	0.18	0.08	0.03	0	0.1	0.54	0.28	0.82
		VillAdi to VillAluna	0	1.91	2.62	9.02	0	0	6.29	13.54	6.29	2.36	0.25	0	2.65	13.54	8.94	22.48
		VillChoura Kalan to ChouraKhurd	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		VillDorangla Road to VillIslampur Link Road	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		VillDorangla Road to VillShapur Link road	0	1.91	2.62	9.02	0	0	6.29	13.54	6.29	2.36	0.29	0	2.65	13.54	8.94	22.48
		Villdorangla Road to villShapur Link road	0	0.97	1.51	6.63	0	0	3.09	9.1	3.09	1.28	0.44	0	1.72	9.1	4.81	13.91
		VillDostpur to	0	1.91	2.62	9.02	0	0	6.29	13.54	6.29	2.45	0.29	0	2.65	13.54	8.94	22.48

		BoharWadala															
		VillNoushehra to VillIslampur Link Road	0	2.29	3.14	10.82	0	0	7.54	16.25	7.54	2.83	0.35	0	3.18	16.25	10.72	26.98
		VillSangorh to Choundra Road	0	1.91	2.62	9.04	0	0	6.29	13.54	6.29	2.36	0.29	0	2.65	13.54	8.94	22.48
		Vill-Dostpur to vill-kamalpur Jattan	0	2.29	3.14	10.82	0	0	7.54	17.25	7.54	2.83	0.35	0	3.18	17.25	10.72	26.98
		Wazirpur Afgana	0.97	1.26	6.63	0	3.09	0	1.28	9.1	4.37	0.44	0	0	0.44	9.1	4.81	13.91
3	Pathankot	UP & sec-4, (sukretsalai)	0	3.22	5.02	22.08	0	0	10.31	30.33	10.30	4.27	1.56	0	5.75	30.31	16.08	46.40
		P 11 Bansipur c-1, c-2	3.22	5.02	22.08	0	10.31	0	4.27	30.33	14.58	1.46	0	0	1.48	30.33	16.06	46.38
		UP & sec-4, Arvelli	0	0	3.24	5.02	0	22.08	0	30.33	0	10.31	4.27	1.49	16.05	30.33	16.05	46.38
		UP & sec-4, charajhikla	0	0	3.22	5.02	0	22.08	0	30.33	0	10.31	4.27	1.46	16.08	30.33	16.05	46.38
		UP & sec-4, Dalla	0	0	3.22	5.02	0	22.08	0	30.31	0	10.31	4.18	1.48	16.05	30.33	16.05	46.38
		UP & sec-4, kot	0	0	3.22	5.02	0	22.08	0	30.33	0	10.31	4.27	1.48	16.05	30.33	16.05	46.38

		UP & sec-4, SukretSalai	0	0	3.22	5.02	0	22.08	0	30.33	0	10.31	4.27	1.48	16.05	30.33	16.05	46.38
		UP & see 4 Matti	0	0	3.22	5.02	0	22.11	0	30.33	0	10.31	4.27	1.48	16.05	30.33	16.05	46.38
Total			**65.26**	**194.6**	**576.03**	**516.63**	**209.84**	**132.51**	**397.24**	**1485.03**	**607.08**	**207.54**	**45.51**	**8.87**	**261.93**	**1485.03**	**869.01**	**2354.03**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 20 (a): Division Wise Proposed Extent of Plantations in Agriculture Landscapes in Punjab

Sr. No	Division	Cost Model	YEAR											Grand Total Area (ha)	
			Phase I (Extent of Area in ha)							Phase I		Phase II			
			I	II		III		IV	V	Total		VI	Total		
			*Estb	Estb	**Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Total	Estb.	Maint
1	Amritsar	RV/PB/AL/01 - Boundary Plantation Model	170	50	170.0	0	220	220	50	220	220	0	0	220	220
		RV/PB/AL/02 - Block Plantation Model	15	10	15.00	12	25	37	22	37	37	12	12	37	37
2	Gurdaspur	RV/PB/AL/01 - Boundary Plantation Model	80	90	80.00	70	170	240	160	240	240	70	70	240	240

		RV/PB/AL/02 - Block Plantation Model	0	29	0.00	10	29	39	39	39	39	10	10	39	39
3	Pathankot	RV/PB/AL/01 - Boundary Plantation Model	60	100	60.00	80	160	240	180	240	240	80	80	240	240
		RV/PB/AL/02 - Block Plantation Model	14	13	14.00	15	27	42	28	42	42	15	15	42	42
Total			**339**	**292**	**339**	**187**	**631**	**818**	**479**	**818**	**818**	**187**	**187**	**818**	**818**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 20 (b): Division Wise Projected Cost of Plantations in Agriculture Landscapes in Punjab

Sr. No	Division	Cost Models	Phase I: Year Wise Cost (Rs in Lakhs)							Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
			I	II		III		IV	V			VI Year				
			*Estb	Estb	**Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Amritsar	RV/PB/AL/01 - Boundary Plantation Model	15.3	4.5	8.19	0	11.78	12.79	2.95	19.8	35.71	0	0	19.8	35.71	55.51

		RV/PB/AL/02 - Block Plantation Model	7.2	4.8	3.85	5.76	6.69	10.24	6.24	17.76	27.02	3.53	3.53	17.76	30.55	48.31
2	Gurdaspur	RV/PB/AL/01 - Boundary Plantation Model	7.2	8.1	3.85	6.3	8.74	13.05	9.17	21.6	34.81	4.13	4.13	21.6	38.94	60.54
		RV/PB/AL/02 - Block Plantation Model	0	13.92	0	4.8	7.45	10.54	11.28	18.72	29.27	2.94	2.94	18.72	32.21	50.93
3	Pathankot	RV/PB/AL/01 - Boundary Plantation Model	5.4	9	2.89	7.2	8.13	12.9	10.31	21.6	34.23	4.72	4.72	21.6	38.95	60.55
		RV/PB/AL/02 - Block Plantation Model	6.72	6.24	3.6	7.2	7.19	11.54	7.94	20.16	30.27	4.41	4.41	20.16	34.68	54.84
Total			**41.82**	**46.56**	**22.38**	**31.26**	**49.98**	**71.06**	**47.89**	**119.64**	**191.31**	**19.73**	**19.73**	**119.64**	**211.04**	**330.68**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 21 (a): Division Wise Proposed Extent of Plantations in Urban Landscapes in Punjab

Sr. No	Division	Cost Model	YEAR											Grand Total	
														Area (ha)	
			Phase I (Extent of Area in ha)							Phase I		Phase II			
			I	II		III		IV	V	Total		VI	Total		
			*Estb	Estb	**Maint	Estb	Maint	Maint	Maint	Estb	Maint	Maint	Total	Estb.	Maint
1	Amritsar	RV/PB/UL/01 - Bioremediation and Bio-filtration	1	1	1	1.1	2	3.1	2.1	3.1	3.1	1.1	1.1	3.1	3.1
		RV/PB/UL/02 - Riverfront Development	0	1	0	0	1	1	1	1	1	0	0	1	1
		RV/PB/UL/03 - Institution Plantation	10	8	10	7	18	25	15	25	25	7	7	25	25
		RV/PB/UL/04 - Eco-park Development	0	1.3	0	1	1.3	2.3	2.3	2.3	2.3	1	1	2.3	2.3
2	Gurdaspur	RV/PB/UL/01 - Bioremediation and Bio-filtration	0	2	0	1	2	3	3	3	3	1	1	3	3

		RV/PB/UL/02 - Riverfront Development	0	0.7	0	0	0.7	0.7	0.7	0.7	0.7	0	0	0.7	0.7
		RV/PB/UL/03 - Institution Plantation	12	10	12	8	22	30	18	30	30	8	8	30	30
		RV/PB/UL/04 - Eco-park Development	0.2	0.4	0.2	0.3	0.6	0.9	0.7	0.9	0.9	0.3	0.3	0.9	0.9
3	Pathankot	RV/PB/UL/01 - Bioremediation and Bio-filtration	0	1	0	2	1	3	3	3	3	2	2	3	3
		RV/PB/UL/02 - Riverfront Development	0	1	0	0	1	1	1	1	1	0	0	1	1
		RV/PB/UL/03 - Institution Plantation	13	11	13	9	24	33	20	33	33	9	9	33	33
		RV/PB/UL/04 - Eco-park Development	0	1.4	0	0	1.4	1.4	1.4	1.4	1.4	0	0	1.4	1.4
Total			**36.2**	**38.8**	**36.2**	**29.4**	**75**	**104.4**	**68.2**	**104.4**	**104.4**	**29.4**	**29.4**	**104.4**	**104.4**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 21 (b): Division Wise Proposed Cost of Plantations in Urban Landscapes

Sr No	Division	Cost Models	Phase I: Year Wise Cost (Rs in Lakhs)							Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
			I	II		III		IV	V			VI Year				
			*Est	Estb	**Maint	Est	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Est	Maint	
1	Amritsar	RV/PB/UL/01 - Bioremediation and Bio-filtration	15	15	4.5	16.5	7.5	10.2	5.55	46.5	27.75	2.48	2.48	46.5	30.23	76.73
		RV/PB/UL/02 - Riverfront Development	0	150	0	0	45	30	22.5	150	97.5	0	0	150	97.5	247.5
		RV/PB/UL/03 - Institution Plantation	26	20.8	7.8	18.2	11.44	13.52	6.76	65	39.52	2.73	2.73	65	42.27	107.25
		RV/PB/UL/04 - Eco-park Development	0	195	0	150	58.5	84	59.25	345	201.75	22.5	22.5	345	224.25	569.25
2	Gurdaspur	RV/PB/UL/01 - Bioremediation and Bio-filtration	0	30	0	15	9	10.5	7.5	45	27	2.26	2.26	45	29.26	74.26

		RV/PB/UL/02 - Riverfront Development	0	105	0	0	31.5	21	15.75	105	68.25	0	0	105	68.25	173.25
		RV/PB/UL/03 - Institution Plantation	31.2	26	9.36	20.8	14.04	16.12	8.06	78	47.58	3.12	3.12	78	50.7	128.7
		RV/PB/UL/04 - Eco-park Development	30	60	9	45	24	30	18	135	81	6.75	6.75	135	87.75	222.75
3	Pathankot	RV/PB/UL/01 - Bioremediation and Bio-filtration	0	15	0	30	4.5	12	8.25	45	24.75	4.5	4.5	45	29.25	74.25
		RV/PB/UL/02 - Riverfront Development	0	150	0	0	45	30	22.5	150	97.5	0	0	150	97.5	247.5
		RV/PB/UL/03 - Institution Plantation	33.8	28.6	10.14	23.4	15.34	17.81	8.97	85.8	52.26	3.51	3.51	85.8	55.77	141.57
		RV/PB/UL/04 - Eco-park Development	0	210	0	0	63	42	31.5	210	136.5	0	0	210	136.5	346.5
Total			136	1005.4	40.8	318.9	328.82	317.15	214.59	1460.3	901.36	47.85	47.85	1460.3	949.21	2409.51

*Est.=Establishment; and **Maint.=Maintenance

Annexure 22 (a): Division Wise Proposed Extent for Soil and Moisture Conservation (Area in m^3) for Punjab

Sr. No	Division	Cost Model	YEAR						Grand Total Area (m3)
			Phase I (Extent of Area in m3)					Phase I	
			I	II	III	IV	V	Total	
			*Estb	Estb	Estb	Estb	Estb	Estb	Estb.
1	Amritsar	RV/PB/CI/01 - Brushwood Interventions	4560	0	1050	2540	0	8150	8150
		RV/PB/CI/02 - Dry Stone activities	0	7000	3280	0	5150	15430	15430
		RV/PB/CI/03 - Crate Wire activities	0	0	0	0	100	100	100
		RV/PB/CI/04 Water Ponds	0	14810	13990	12530	0	41330	41330
2	Gurdaspur	RV/PB/CI/01 - Brushwood Interventions	8590	200	2430	4600	0	15820	15820
		RV/PB/CI/02 - Dry Stone activities	1000	12100	5200	0	9200	27500	27500
		RV/PB/CI/03 - Crate Wire activities	1800	1200	0	0	0	3000	3000
		RV/PB/CI/04 Water Ponds	0	20770	26420	25100	0	72290	72290
3	Pathankot	RV/PB/CI/01 - Brushwood Interventions	100	0	0	50	0	150	150

		RV/PB/CI/02 - Dry Stone activities	200	200	150	0	100	650	650
		RV/PB/CI/03 - Crate Wire activities	0	300	0	0	0	300	300
		RV/PB/CI/04 Water Ponds	0	0	780	0	0	780	780
Total			**16250**	**56580**	**53300**	**44820**	**14550**	**185500**	**185500**

*Est.=Establishment

Annexure 22 (b): Division Wise Proposed Extent for Soil and Moisture Conservation (Cost) for Punjab

Sr. No	Division	Cost Models	Phase I: Year Wise Cost (Rs in Lakhs)					Total Phase I (Rs.in Lakhs)	Grand Total (Rs.in Lakhs)
			I	II	III	IV	V		
			*Estb	Estb	Estb	Estb	Estb	Estb	
1	Amritsar	RV/PB/CI/01 - Brushwood Interventions	13.68	0	3.15	7.62	0	24.45	24.45
		RV/PB/CI/02 - Dry Stone activities	0	126	59.04	0	92.7	277.74	277.74
		RV/PB/CI/03 - Crate Wire activities	0	0	0	0	4.5	4.5	4.5
		RV/PB/CI/04 Water Ponds	0	51.84	48.97	43.86	0	144.67	144.67

2	Gurdaspur	RV/PB/CI/01 - Brushwood Interventions	25.77	0.6	7.29	13.8	0	47.46	47.46
		RV/PB/CI/02 - Dry Stone activities	18	217.8	93.6	0	165.6	495	495
		RV/PB/CI/03 - Crate Wire activities	81	54	0	0	0	135	135
		RV/PB/CI/04 Water Ponds	0	72.7	92.47	87.85	0	253.02	253.02
3	Pathankot	RV/PB/CI/01 - Brushwood Interventions	0.3	0	0	0.15	0	0.45	0.45
		RV/PB/CI/02 - Dry Stone activities	3.6	3.6	2.7	0	1.8	11.7	11.7
		RV/PB/CI/03 - Crate Wire activities	0	13.5	0	0	0	13.5	13.5
		RV/PB/CI/04 Water Ponds	0	0	2.73	0	0	2.73	2.73
Total			**142.35**	**540.04**	**309.95**	**153.28**	**264.6**	**1410.22**	**1410.22**

*Est.=Establishment

Annexure 23 (a): Division Wise Proposed Extent (in ha) for Riverine and Riparian Wetland Management and Wildlife Conservation in Punjab (with sitename)

Sr. No	Division	Cost Model	YEAR									Grand Total Area (ha)	
			Phase I (Extent of Area in ha)					Phase I		Phase II			
			I	II		III	IV	V	Total		VI	Total		
			*Estb	Estb		**Maint	Maint	Maint	Maint		Estb	Maint	Maint	Total
1	Amritsar	Jastarwal Jheel	6	0	6	6	6	6	6	24	0	0	6	6
2	Pathankot WL	Kathlaur Kushlian	0	20	0	20	20	20	20	60	20	20	20	20
3	Pathankot WL	Ranjit Sagar Dam	0	50	0	50	50	50	50	150	50	50	50	50
		Ranjit Sagar Dam Conservation Reserve	0	37	0	37	37	37	37	111	37	37	37	37
Total			**6**	**107**	**6**	**113**	**113**	**113**	**113**	**345**	**107**	**107**	**113**	**113**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 23 (b): Division Wise Projected Cost (Rs. in Lakhs) for Riverine and Riparian Wetland Management and Wildlife Conservation in Punjab (with sitename)

Sr. No	Division	Cost Models	Phase I: Year Wise Cost (Rs in Lakhs)						Total Phase I (Rs.in Lakhs)		Phase II (Rs.in Lakhs)	Total Phase II (Rs.in Lakhs)	Total Phase I & phase II (Rs.in Lakhs)		Grand Total (Rs.in Lakhs)
			I	II			IV	V			VI Year				
			*Estb	Estb	**Maint	Maint	Maint	Maint	Estb	Maint	Maint	Maint	Estb.	Maint	
1	Amritsar	Jastarwal Jheel	16.80	0	0	9.60	7.20	5.40	16.80	37.20	0	0	16.80	37.20	54.00
2	Pathankot WL	Kathlaur Kushlian	0	64.00	64	56.00	38.00	24.00	64.00	118.00	18.00	18.00	64	1360.00	200.00
3	Pathankot WL	Ranjit Sagar Dam	0	140.0	140	125.00	80.00	60.00	140.00	265.00	45.00	45.00	140	310.00	450.00
		Ranjit Sagar Dam Conservation Reserve	0	118.4	118.40	103.60	70.30	44.40	118.40	218.30	33.30	33.30	118.40	251.60	370.00
Total			**16.80**	**322.4**	**322.40**	**294.20**	**195.50**	**133.80**	**339.20**	**638.50**	**96.30**	**96.30**	**339.20**	**734.80**	**1074.00**

*Est.=Establishment; and **Maint.=Maintenance

Annexure 24: The Geo Co-ordinates and model name of Proposed Forestry Intervention Sites in Natural Landscape of Ravi Riverscape in Himachal Pradesh

Sr No.	Model	State	District	Division	Sitename	Range	Block	Beat	Area (ha.)	Lat1	Long1	Ele1
1	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Bharmour	Bagdu Ghar	Bharmour	Sandi	Sirdi	8	32.48073	76.46494	
2	RV/HP/NL/03 - Temperate Coni fer Forest	Himachal Pradesh	Chamba	Bharmour	Chaled Ghar	Bharmour	Bharmour	Gnarau	9	32.44247	76.53387	2077
3	RV/HP/NL/03 - Temperate Coni fer Forest	Himachal Pradesh	Chamba	Bharmour	Dhuwan Nalla	Bharmour	Bharmour	Siunr	9	32.41583	76.49606	1831
4	RV/HP/NL/03 - Temperate Coni fer Forest	Himachal Pradesh	Chamba	Chamba	Aate DPF	Upper Chamba	Khundel	Almi	18	32.57528	76.37278	
5	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Badath	Tikri	chanju	chanju	10	32.72515	76.15278	1647
6	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Bagga CA	Upper Chamba	Kundi	Kundi	18	32.47222	76.25611	
7	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Baliani	Upper Chamba	Kundi	Darkund	10	32.41028	76.275	
8	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Bhadhor	Upper Chamba	Chhatarari	Ichre	5	32.44889	76.35806	1420

9	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Bhadruni CA	Upper Chamba	Khundel	Almi	5	32.51417	76.37556	
10	RV/HP/NL/03 Temperate Conifer Forest	Himachal Pradesh	Chamba	Chamba	Bhala/ Sanoli DPF	Lower chamba	Saho	chuda	7	32.57083	76.17111	
11	RV/HP/NL/03 Temperate Conifer Forest	Himachal Pradesh	Chamba	Chamba	Brehi	Upper Chamba	Kundi	Brehi	12	32.44083	76.30222	
12	RV/HP/NL/07 - Himalayan Mix ed Forest	Himachal Pradesh	Chamba	Chamba	Challoga CA	Lower chamba	Saho	Saho	10	32.58109	76.24135	
13	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	**C**hamba	Chamba	Chamla	Tikri	Jassour Garh	Jassour Garh	9	32.76358	76.18275	1503
14	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Chandruni Dhar	Upper Chamba	Khundel	Almi	20	32.47909	76.17819	1147
15	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Chau CA	Upper Chamba	Kundi	Kundi	10	32.46778	76.29	
16	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Choo	Upper Chamba	Chatrari	Tarouni	5	32.45667	76.32694	1570
17	RV/HP/NL/03 Temperate Conifer Forest	Himachal Pradesh	Chamba	Chamba	Chubu Galla	Upper Chamba	Kundi	Darkund	7	32.41916	76.26444	
18	RV/HP/NL/04 - Temperate Mixed	Himachal Pradesh	Chamba	Chamba	Chuhhani	Upper Chamba	Khundel	Lylh	10	32.47889	76.30639	

	Forest											
19	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Daggi Ghar	Upper Chamba	Khundel	Lylh	10	32.48722	76.28528	
20	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Darkund	Upper Chamba	Kundi	Darkund	6	32.41472	76.29306	
21	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Chamba	Duari	lower chamba	chamba	Sarodi	5	32.53687	76.10074	920
22	RV/HP/NL/04 - Temperate Mixed Forest	Pradesh	Chamba	Chamba	Fati CA	Tikri	Jassour garh	Deola	8	32.82755	76.14648	1361
23	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Gaggal CA	Masrond	**P**ukhri	chakloo	8	32.63056	76.18389	888
24	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Gandri DPF	Lower chamba	Silla	Dhar	8	32.65758	76.19519	2062
25	RV/HP/NL/06 - Himalayan ChirPine Forest	Himachal Pradesh	Chamba	Chamba	Ghilli	Masrond	Chhatri	Sikri	10	32.72639	76.15167	
26	RV/HP/NL/06 Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Ghudha Gudha	Upper Chamba	Bakani	Mortu	5	32.49832	76.16294	
27	RV/HP/NL/08 -Sub-Tropical Dry Deciduous Fore st	Himachal Pradesh	**C**hamba	Chamba	Gohanana	Upper Chamba	Mehla	Morh	5	32.48792	76.17523	
28	RV/HP/NL/07	Himachal	Chamba	Chamba	Guwadi	Masrond	Chhatri	Kalhel	9	32.73611	76.13306	

	Himalayan Mixed Forest	Pradesh			DPF							
29	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Jamela DPF	Lower chamba	Silla	Dhar	10	32.62306	76.2075	
30	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Jangi CA	Upper Chamba	Bakani	Kalandra	12	32.47778	76.19222	
31	RV/HP/NL/07 - Himalayan Mixed Forest	Himachal Pradesh	Chamba	Chamba	Jhunas	Upper Chamba	Bakani	Bakani	5	32.46028	76.21472	
32	RV/HP/NL/03 Temperate Conifer Forest	Himachal Pradesh	Chamba	Chamba	Kalandra Bathri	Upper Chamba	Bakani	Kalandra	12	32.47871	76.17974	
33	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Chamba	Kalandra Bathri	Upper Chamba	Bakani	Kalandra	12	32.49167	76.20389	
34	RV/HP/NL/07 - Himalayan Mixed Forest	Himachal Pradesh	**C**hamba	Chamba	Kalandra CA	Upper Chamba	Bakani	Kalandra	12	32.48622	76.19722	
35	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Kalwara	Upper Chamba	Kundi	Kalwara	10	32.42972	76.24417	
36	RV/HP/NL/06 Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Kamotha CA	Masrond	Masrond	Dugli	2	32.83417	76.17917	1058
37	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Karpok	Upper Chamba	Bakani	Bakani	5	32.4475	76.22611	

38	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Kathwar DPF	Tikri	chanju	Bashei	5	32.75079	76.38472	1800
39	RV/HP/NL/07 - Himalayan Mixed Forest	Himachal Pradesh	Chamba	Chamba	Khaddal	Upper Chamba	Khundel	Belj	5	32.49	76.34389	
40	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Khorgoth CA	Upper Chamba	Kundi	Darkund	19	32.42	76.27167	
41	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Kiratot	Tikri	Thalli	Nagani	5	32.83523	76.2244	1711
42	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Kohal Kuthes C-A	Masrond	Masrond	Kohal	3	32.85056	76.35444	1809
43	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Kundlodine	Tikri	Thalli	Bara	5	32.82817	76.23856	1900
44	RV/HP/NL/07 - Himalayan Mixed Forest	Himachal Pradesh	Chamba	Chamba	Kuthar DPF	Masrond	Masrond	Kandla	3	32.68863	76.06826	851
45	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Lodhar	Upper Chamba	Bakani	Bakani	11	32.43417	76.21889	5120
46	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Lothal	Upper Chamba	Kundi	Kundi	10			
47	RV/HP/NL/06 - Himalayan Chir Pine	Himachal Pradesh	Chamba	Chamba	Luna	Upper Chamba	Chhatrari	Chhatrari	8	32.45667	76.32694	1360

	Forest											
48	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Mandola	Tikri	chanju	chanju	10	32.78354	76.17627	1621
49	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Manju	Masrond	Chhatri	Salovo	3	32.76621	76.14833	
50	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Masrond Laddi-II	Masrond	Masrond	Masrond	10	32.68809	76.09243	
51	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Masrond Laddi-II	Masrond	Masrond	Masrond	9	32.68895	76.09131	
52	RV/HP/NL/06 Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Mehla Nala	Upper Chamba	Bakani	Mehla	8	32.46956	76.18545	
53	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Moha DPF	Tikri	chanju	Bashei	5	32.55258	76.08348	
54	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Nagooni C.A	Lower chamba	Chamba	Gudda	7	32.52944	76.19528	
55	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Padhri	Upper Chamba	Kundi	Kalwara	15	32.42361	76.24611	
56	RV/HP/NL/06 Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Rupni D.P.F	Masrond	Pukhri	kiani	8	32.62278	76.05056	
57	RV/HP/NL/03 -	Himachal	Chamba	Chamba	Ruvandi CA	Masrond	Pukhri	Ghargran	5	32.88694	76.30306	

	Temperate Conifer Forest	Pradesh										
58	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Sadoon CA	Upper Chamba	Kundi	Darkund	8	32.42417	76.26667	
59	RV/HP/NL/06 Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Saklana	Upper Chamba	Bakani	Loa	11	32.47361	76.1875	
60	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Sapan	Tikri	chanju	Dantuin	5	32.66694	76.35111	
61	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Sarana	Masrond	chhatri	chhatri	10	32.71361	76.17806	
62	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Shiv Panihar	Masrond	Pukhri	Palei	7	32.64667	76.03306	1198
63	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Sulaha CA	Upper Chamba	Bakani	kalandra	12	32.48472	76.23889	
64	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Sundri C.A	Tikri	chanju	Sundri	5	32.70556	76.27167	
65	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Thalli D.P.F	Tikri	Thalli	Thalli	2	32.80345	76.16407	1792
66	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Tikrigarh DPF	Tikri	Jassor	Tikri	5	32.77704	76.18703	1470

67	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Tolai DPF	Lower Chamba	Chhabares	Talai	3	32.525	76.07667	1855
68	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Chamba	Udai Nallah	Masrond	Masrond	Mani	9	32.79194	76.15667	1878
69	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Chamba	Uteep C.A	Lower chamba	chamba	Lower chamba	7	32.53083	76.15417	
70	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Ainthen Dhar Pasture Development	Tissa	Tissa	Devikothi	18	32.94105	76.2395	2964
71	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Aoun Dhar Pasture Development	Tissa	Baira	Shoul	10	32.8296	76.15057	1425
72	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Churah	Badhel / Bambeu	Bhalei	Bhalei	Bhalei	10	32.62809	75.99878	1183
73	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Churah	Baggi DPF	Bhalei	Bhunad	Smah	5	32.62044	75.92241	816
74	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Churah	Bhadsar CA	Tissa	Sei	Sagti	12	32.82708	76.08491	1641
75	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Bhangaid CA	Tissa	Baira	Shoul	5	32.82968	76.15165	1396
76	RV/HP/NL/03 - Temperate Coni fer Forest	Himachal Pradesh	Chamba	Churah	Bhangwad C.A	Tissa	Tissa	Pugthala	10	32.87788	76.20852	2600

77	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Churah	Bhatiyund Ghar 2021-22	Chakoli	Salooni	Manjeer	5	32.71967	76.06389	1380
78	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Bidha Pasture Development	Tissa	Baira	Baira	15	32.90133	76.16303	2270
79	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Butla 2nd	Bhalei	Sundla	Salwan	5	32.72692	75.96394	2308
80	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Chabadh CA	Tissa	Sei	Jangbani	12	32.87237	76.01639	2250
81	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Chachul CA	Tissa	Sei	Jangbani	10	32.86268	76.00932	2268
82	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Chachul dhar pasture development	Tissa	Sei	Jangbani	15	32.88659	75.98904	3507
83	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Chamwas CA	Himgiri	Khangu	Chilli	5	32.82771	76.09617	4594
84	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Chandi Mandralla Dhar	Chakoli	Kihar	Gulel	20	32.9725	76.16306	2427
85	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Chanjali CA	Tissa	Baira	Shoul	12	32.90723	76.14695	1647
86	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Chiugali CA	Bhalei	Bhunad	Badka	10	32.72415	75.92973	2290

87	RV/HP/NL/04 - Temperate Mixed Fores	Himachal Pradesh	Chamba	Churah	Dadiyund CA	Tissa	Baira	Shoul	10	32.90292	76.16266	2290
88	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Daloran	Tissa	Tissa	Chandru	10	32.92333	76.2775	2464
89	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Damtaal CA	Tissa	Baira	Shoul	10	32.91099	76.09924	2247
90	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Dar	Tissa	Tissa	Chandru	10	32.92083	76.24958	2471
91	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Dehal Pasture Development	Tissa	Tissa	Pugthala	15	32.86979	76.21711	3075
92	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Dellu C.A	Tissa	Baira	Mansa	7	32.94404	76.15823	
93	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Dhabbi-1st-C.A.	Himgiri	khangu	chundi	5	32.88645	76.1108	5065
94	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Dhabbi-2nd-C.A.	Himgiri	khangu	chundi	5	32.9736	76.1133	5205
95	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Dhaneli CA	Tissa	Sei	Jangbani	10	32.86838	76.03188	2254
96	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Dhar Chammed Pasture	Tissa	Tissa	Chandru	50	32.86256	76.33962	4209

					Development							
97	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Dharopad C.A.	Chakoli	Panoga	Panoga	5	32.7668	75.95417	2129
98	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Dhel Top CA	Tissa	Sei	Jangbani	8	32.87815	76.0272	2833
99	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Dibhari CA	Bhalei	Sundla	Salwan	15	32.73836	75.95135	2706
100	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Dol Ghar	Bhalei	Sundla	Jund	5	32.70282	76.01145	1570
101	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Dudra	Tissa	Tissa	Tissa	40	32.86247	76.18384	2678
102	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Dumes C.A.	Tissa	Baira	Baira	12	32.90365	76.16427	2396
103	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Dunwad C.A	Tissa	Tissa	Pugthala	9	32.87788	76.20852	2600
104	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Churah	Fangei CA	Bhalei	Bhalei	Bhing	5	32.66853	75.99329	1130
105	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Churah	Gagal C.A.	Tissa	Sei	Sagti	10	32.82583	76.08306	
106	RV/HP/NL/06 -	Himachal	Chamba	Churah	Ganed	Tissa	Tissa	Tissa	10	32.83756	76.18851	1417

	Himalayan Chir Pine Forest	Pradesh										
107	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Ghadetra Ghar Land Slide /Slips	Chakoli	Panoga	Talai	5	32.775	75.94597	1823
108	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Googlotu C.A.	Tissa	Baira	Baira	8	32.81291	76.14834	
109	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Goongoth C.A.	Chakoli	Panoga	Bhaint	10	32.78617	75.91247	2294
110	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Goth C.A	Tissa	Tissa	Pughala	11	32.87788	76.20852	2600
111	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Grohan CA	Chakoli	Kihar	Gulel	5	32.97806	76.20694	1824
112	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Guery	Tissa	Sei	Gungiyas	7	32.87847	76.13447	1810
113	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Guthdu C.A.	Chakoli	Panoga	Panoga	5	32.8212	76.13703	
114	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Guwadi CA	Bhalei	Bhunad	Bhunad	5	32.52749	76.08405	
115	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Hail Dhar Pasture Development	Tissa	Tissa	Devikothi	15	32.93778	76.23806	2550

116	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Hail Nala C.A.	Tissa	Tissa	Devikothi	10	32.93956	76.25156	2519
117	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Hailara	Tissa	Sei	Gungiyas	10	32.8988	76.07341	2787
118	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Haloga	Tissa	Sei	Gungiyas	5	32.8668	76.11815	2090
119	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Ichharani CA	Tissa	Baira	Mansa	10	32.9396	76.16578	2042
120	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Churah	Indal CA	Tissa	Sei	Sagti	10	32.83393	76.11149	1667
121	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Isali pasture development	Tissa	Sei	Jangbani	15	32.87131	76.04061	2452
122	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Churah	Jaddu 1st C.A.	Chakoli	Salooni	Manjeer	5	32.74456	76.11156	1052
123	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Churah	Jaddu 2nd C.A. 2021-22	Chakoli	Salooni	Manjeer	5	32.74403	76.10625	1084
124	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Jagot CA	Bhalei	Bhalei	Bhing	5	32.67249	75.94504	1877
125	RV/HP/NL/03 - Temperate Conifer	Himachal Pradesh	Chamba	Churah	Jainshree Ghar	Chakoli	Salooni	Manjeer	3	32.7055	76.047	1208

	Forest											
126	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Jajwas	Tissa	Sei	Gungiyas	7	32.87183	76.13817	1595
127	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Jamoth C.A.2021-22	Chakoli	Kihar	Bhadroh	10	32.895	76.23667	2888
128	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Jhamooni C.A.	Tissa	Baira	Mansa	10	32.94734	76.15888	
129	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Jinni C.A.	Tissa	Baira	Baira	10	32.90532	76.1688	2536
130	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Kala ban C.A	Tissa	Baira	Baira	10	32.90313	76.16562	2414
131	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Churah	Kalon Ghar 2021-22	Chakoli	Salooni	Manjeer	5	32.71933	76.068	1294
132	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Kalopad pasture development	Tissa	Sei	Jangbani	17	32.84894	76.03611	1916
133	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Churah	Kandolu CA	Tissa	Sei	Sagti	10	32.82708	76.08491	1641
134	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Khadwal CA	Tissa	Sei	Jangbani	7	32.84902	76.03937	1880
135	RV/HP/NL/04 - Temperate Mixed	Himachal Pradesh	Chamba	Churah	KhajiriyalaC.A. (2021-	Chakoli	Salooni	Singhadhar	10	32.76272	76.117	

	Forest				22)year							
136	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Churah	Khakhdi	Tissa	Tissa	Tissa	10	32.81697	76.13181	1161
137	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Kharundi Dhar Pasture Development	Tissa	Tissa	Devikothi	17	32.92056	76.23	2519
138	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Kotli CA	Bhalei	Bhunad	Smah	5	32.63106	75.97146	1801
139	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Kuflani DPF	Bhalei	Bhalei	Wangal	10	32.75083	76.15306	1692
140	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Kulthod C.A.	Tissa	Sei	Sagti	10	32.83393	76.11149	1667
141	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Kundala C.A.	Tissa	Tissa	Pugthala	7	32.92333	76.2775	2446
142	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Likdi CA	Tissa	Sei	Jangbani	12	32.86367	75.99393	2541
143	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Majhogo Pasture Development	Tissa	Baira	Baira	15	32.90118	76.15954	2071
144	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Makkan dhar pasture development	Tissa	Sei	Jangbani	18	32.84776	76.03171	1807
145	RV/HP/NL/03 - Temperate Conifer	Himachal Pradesh	Chamba	Churah	Makol Ki	Himgiri	Khangu	Chilli	5	32.8025	76.09051	7293

	Forest				Naali							
146	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Malikundi C.A.	Tissa	Baira	Mansa	10	32.95502	76.15872	
147	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Mandralla Dhar	Chakoli	Panoga	Panoga	20	32.77364	75.94194	2299
148	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Maniyala C.A.	Tissa	Baira	Baira	10	32.9062	76.15908	
149	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Mansa Dhar C.A	Tissa	Baira	Mansa	6	51.85339	76.29	2736
150	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Marali CA	Tissa	Tissa	Pugthala	12	32.878	76.19706	2446
151	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Matiyund Dhar Pasture Development	Tissa	Sei	Sagti	10	32.86291	76.08671	2712
152	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Miyund Pasture Development	Tissa	Baira	Baira	17	32.89947	76.15556	
153	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Mundolu CA	Bhalei	Sundla	Salwan	10	32.72941	75.96649	2567
154	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Nakuin C.A	Tissa	Baira	Mansa	12	32.93625	76.16615	2216
155	RV/HP/NL/04 - Temperate Mixed	Himachal Pradesh	Chamba	Churah	New C.A. Anjani	Himgiri	Himgiri	Billa	5	32.77962	76.07629	2572

	Forest											
156	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	New C.A.phukar	Himgiri	khangu	chundi	5	32.82361	76.06139	1836
157	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	New CA Adan Dhar	Himgiri	Khangu	Ail	10	32.83796	76.00157	9345
158	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	New CA Kalyani	Himgiri	Himgiri	Himgiri	5	32.79289	76.08582	8606
159	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	New CA Ladrrora	Himgiri	Khangru	Thanella	10	32.81857	76.07776	1637
160	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	New CA Marali Dhar	Himgiri	Khangu	Thanella	10	32.80667	76.05481	2307
161	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	New CA Padhrota	Himgiri	Himgiri	Himgiri	5	32.78762	76.09138	7915
162	RV/HP/NL/03 - Temperate Conifer forest	Himachal Pradesh	Chamba	Churah	New CA Phukar	Himgiri	Himgiri	Himgiri	5	32.79289	76.08582	8606
163	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	New CA Randoll	Himgiri	Khangru	Ail	10	32.85235	76.07326	7989
164	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	New CA Sahu	Himgiri	Khangu	AIL	10	32.85059	76.01311	7541
165	RV/HP/NL/04 -	Himachal	Chamba	Churah	New CA	Himgiri	Himgiri	Himgiri	5	32.78039	76.09812	6043

	Temperate Mixed Forest	Pradesh			Shagla Ghar							
166	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	New CA Shurnalla	Himgiri	Himgiri	Himgiri	5	32.78834	76.09683	6410
167	RV/HP/NL/03 - Temperate Coni fer Forest	Himachal Pradesh	Chamba	Churah	Nili nadi CA	Tissa	Sei	Jangbani	10	32.86517	76.04703	
168	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Nondal Pasture Development	Tissa	Baira	Mansa	15	32.89771	76.15877	
169	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Padharala CA	Tissa	Sei	Sagti	7	32.86495	76.0846	2842
170	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Pakat C.A.	Tissa	Baira	Baira	7	32.90055	76.15435	
171	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Pakhurotu Dhar	Tissa	Baira	Mansa	15	32.93913	76.15893	
172	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Paniyala C.A.	Tissa	Tissa	Devikothi	8	32.89944	76.21667	2000
173	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Paniyali CA	Tissa	Sei	Sagti	9	32.86495	76.0846	2842
174	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Panjtara Dhar Pasture Development	Tissa	Baira	Mansa	18	32.95544	76.14285	

175	RV/HP/NL/05 - Pasture and Grazing Land Development	Himachal Pradesh	Chamba	Churah	Pasture CA Mandrala Dhar	Chakoli	Salooni	Kilod	15	32.73658	75.96036	2717
176	RV/HP/NL/05 - Pasture and Grazing Land Development	Himachal Pradesh	Chamba	Churah	Pasture Dev. in Khajrali Dhar	Chakoli	Kihar	Kihar	20	32.78545	75.99889	2643
177	RV/HP/NL/05 - Pasture and Grazing Land Development	Himachal Pradesh	Chamba	Churah	Pasture Developme nt Hindal Dhar	Chakoli	Kihar	Bhadroh	15	32.90722	76.12667	2880
178	RV/HP/NL/05 - Pasture and Grazing Land Development	Himachal Pradesh	Chamba	Churah	Pasture Developme nt Mandralla Dhar	Chakoli	Panoga	Jamla	10	32.77617	75.90222	2780
179	RV/HP/NL/05 - Pasture and Grazing Land Development	Himachal Pradesh	Chamba	Churah	Pasture Developme nt Manghali Dhar	Chakoli	Panoga	Bhaint	10	32.81445	75.87572	2442
180	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Patotari CA	Chakoli	Salooni	Kilod	10	32.74142	75.98911	1903
181	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Plantation Bani CA	Chakoli	Salooni	Salooni	15	32.73722	76.03889	1780
182	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Plantation Tambu C.A.	Chakoli	Salooni	Singha dhar	10	32.75992	76.10875	
183	RV/HP/NL/04 - Temperate Mixed	Himachal Pradesh	Chamba	Churah	Polla CA	Tissa	Sei	Sagti	10	32.85194	76.06611	

	Forest											
184	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Pring Closed Area	Chakoli	Kihar	Diur	5	32.75453	76.02194	1796
185	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Rai goth CA (Jangbani Beat)	Tissa	Sei	Jangbani	6	32.88042	76.02246	9806
186	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Rai Goth CA (Sagti Beat)	Tissa	Sei	Jangbani	6	2.88044	76.02246	9806
187	RV/HP/NL/05 - Pasture and Grazing Land Development	Himachal Pradesh	Chamba	Churah	Raje Da Dera 1st Dhar (Pasture Development)	Chakoli	Panoga	Talai	15	2.74528	75.92869	2829
188	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Raje Da Dera 2nd	Chakoli	Panoga	Talai	5	32.74425	75.92308	2493
189	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Reyod C.A. (2021-22) years	Chakoli	Salooni	Singha dhar	10	32.75922	76.11222	
190	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Roghad	Tissa	Tissa	Chandru	12	32.9152	76.28084	2461
191	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Rohoov C.A.	Tissa	Baira	Baira	12	32.89712	76.16637	2036
192	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Rouni Dhar Pasture Development	Tissa	Baira	Mansa	17	32.95137	76.18157	
193	RV/HP/NL/03 -	Himachal	Chamba	Churah	Sagroot CA	Bhalei	Bhunad	Smah	5	32.63595	75.96539	1510

	Temperate Conifer Forest	Pradesh										
194	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Sagti Dhar Pasture Development	Tissa	Sei	Sagti	12	32.84997	76.1111	2549
195	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Sagti Nalla CA	Tissa	Sei	Sagti	12	32.85148	76.08515	2204
196	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Sakrau Pasture Development	Tissa	Tissa	Pugthala	15	32.82682	76.14603	1439
197	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Saproth Dhar Pasture Development	Tissa	Sei	Sagti	10	32.85039	76.10844	2540
198	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Sarkau pasture	Tissa	Tissa	Pugthala	15	32.86785	76.20605	3036
199	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Sarotu C.A.	Chakoli	Kihar	Gulel	5	32.84833	76.1125	1862
200	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Seri	Tissa	Sei	Gungiyas	10	32.88261	76.11815	1743
201	RV/HP/NL/07 - Himalayan Mi ed Forest	Himachal Pradesh	Chamba	Churah	Shali CA	Bhalei	Sundala	Jund	5	32.71918	75.99552	1731
202	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Shoul Beat	Tissa	Baira	Shoul	12	32.90723	76.14695	1647
203	RV/HP/NL/03 -	Himachal	Chamba	Churah	Sikdiyah CA	Bhalei	Bhunad	Smah	5	32.64924	75.96274	2120

	Temperate Conifer Forest	Pradesh										
204	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Singalu C.A.	Chakoli	Salooni	Kilod	10	32.73308	75.97081	2276
205	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Singra C.A	Tissa	Baira	Mansa	8	32.94263	76.16205	2085
206	RV/HP/NL/03 - Temperate Conifer Forest	Himachal Pradesh	Chamba	Churah	Sinol C.A.	Tissa	Tissa	Devikothi	12	32.90056	76.22667	2018
207	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Sokhdu Panihar CA	Himgiri	Khangu	Chilli	5	32.82189	76.09723	5489
208	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Suin C.A.	Chakoli	Kihar	Kihar	10	32.77106	76.02111	2008
209	RV/HP/NL/05 - Pasture and Grazing Land Development	Himachal Pradesh	Chamba	Churah	Suin Dhar Pasture CA	Chakoli	Salooni	Kilod	15	32.73694	75.95667	2677
210	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Suked C.A.	Chakoli	Kihar	Bhadroh	10	32.86972	76.17722	2774
211	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Supe Da Kholl C.A.	Chakoli	Panoga	Jamla	10	32.78522	75.91986	
212	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Tepa C.A.	Tissa	Tissa	Devikothi	10	32.92806	76.24528	2020

213	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Thal CA	Bhalei	Bhunad	Bhunad	5	32.68479	75.93013	2122
214	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Tharan C.A	Tissa	Baira	Mansa	12	51.51519	77.45139	3201
215	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Thatti-I C.A	Tissa	Tissa	Pugthala	12	32.8889	76.16681	2321
216	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Thatti-II C.A	Tissa	Tissa	Pugthala	8	32.8889	76.16681	2321
217	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Topa CA	Bhalei	Bhunad	Badka	10	32.72568	75.92907	2243
218	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Trakkar DarPasture Development	Tissa	Tissa	Chandru	30	32.92639	76.26528	2810
219	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Trakkar Dar Pasture Development	Tissa	Tissa	Chandru	60	32.93117	76.27366	3628
220	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Tund CA	Tissa	Tissa	pugthala	15	32.87894	76.22091	2557
221	RV/HP/NL/04 - Temperate Mixed Forest	Himachal Pradesh	Chamba	Churah	Upper Tain	Tissa	Tissa	Chandru	10	32.905	76.28528	2571
222	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Dalhousie	Chalela	Bakloh	Nainikhad	Katori	23	32.45828	75.89841	

223	RV/HP/NL/08 -Sub-Tropical Dry Deciduous Forest	Himachal Pradesh	Chamba	Dalhousie	Chambi	Bakloh	Mail	Sandhara	8	32.52559	75.89183	1030
224	RV/HP/NL/08 - Sub-Tropical Dry Deciduous Forest	Himachal Pradesh	Chamba	Dalhousie	Dadra Phat	Dalhousie	Chaned	Bhanota	5	32.60848	76.06383	793
225	RV/HP/NL/08 -Sub-Tropical Dry Deciduous Forest	Himachal Pradesh	Chamba	Dalhousie	Dagoh DPF	Bakloh	Nainikhad	Tunuhatti	9	32.47071	75.90953	
226	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Dalhousie	Dharoon	Bakloh	Mail	Mail	6	32.51984	75.90388	1130
227	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Dalhousie	Jandrah	Bakloh	Nainikhad	Tunuhatti	30	32.47151	75.91496	1165
228	RV/HP/NL/08 -Sub-Tropical Dry Deciduous Forest	Himachal Pradesh	Chamba	Dalhousie	Kapei	Bakloh	Mail	kandei	10	32.58377	75.89948	750
229	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Dalhousie	Kapei Ghar	Bakloh	Mail	kandei	9	32.58158	75.89916	850
230	RV/HP/NL/08 -Sub-Tropical Dry Deciduous Forest	Himachal Pradesh	Chamba	Dalhousie	Lahri	Bakloh	Mail	Sandhara	8	32.52782	75.86758	613
231	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Dalhousie	Mornu	Bakloh	Mail	Mansa	9	32.52144	75.90595	1200
232	RV/HP/NL/07 - Himalayan Mixed	Himachal Pradesh	Chamba	Dalhousie	Nakala (Banska)	Dalhousie (Surkhigalla)	Chaned	Singi	5	32.58901	76.06881	1314

	Forest											
233	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Dalhousie	Rouni No. 1 DPF	Bakloh	Nainikhad	Tunuhatti	9	32.48467	75.91639	909
234	RV/HP/NL/08 -Sub-Tropical Dry Deciduous Forest	Himachal Pradesh	Chamba	Dalhousie	Rouni No. 2 DPF	Bakloh	Nainikhad	Tunuhatti	6	32.49194	75.90359	726
235	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Dalhousie	Salig Tikkar	Dalhousie	Chaned	Bhanota	5	32.59446	76.06768	1079
236	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Dalhousie	Samana - I	Dalhousie (Sukhigalla)	Chaned	Udaipur	5	32.57667	76.10766	1106
237	RV/HP/NL/06 - Himalayan Chir Pine Forest	Himachal Pradesh	Chamba	Dalhousie	Samana C-II	Dalhousie (Surkhigalla)	Chaned	Udaipur	5	32.57235	76.08288	1221
238	RV/HP/NL/08 - Sub-Tropical Dry Deciduous Forest	Himachal Pradesh	Chamba	Dalhousie	Samleu	Bakloh	Mail	kandei	8	32.59771	75.906	890

Annexure 25 :The Geo Co-ordinates and model name of Proposed Forestry Intervention Sites in Fire Protection of Ravi Riverscape in Himachal Pradesh

Sr No	Model	State	District	Division	Sitename	Area (ha.)	Lat1	Long1	Ele1
1	RV/HP/NL/12 - Fire Protection Model	Himachal Pradesh	Chamba	Bharmour	Bharmour Division	15			

2	RV/HP/NL/11 - Protection Model for Natural Regeneration	Himachal Pradesh	Chamba	Bharmour	Bharmour Division 1	100	32.44205	76.5312	
3	RV/HP/NL/11 - Protection Model for Natural Regeneration	Himachal Pradesh	Chamba	Bharmour	Bharmour Division 2	80	32.44205	76.5312	
4	RV/HP/NL/12 - Fire Protection Model	Himachal Pradesh	Chamba	Chamba	Chamba Division	40	32.54769	76.12832	
5	RV/HP/NL/11 - Protection Model for Natural Regeneration	Himachal Pradesh	Chamba	Chamba	Chamba Division 1	100	32.5494	76.12803	
6	RV/HP/NL/11 - Protection Model for Natural Regeneration	Himachal Pradesh	Chamba	Chamba	Chamba Division 2	120	32.5494	76.12803	
7	RV/HP/NL/12 - Fire Protection Model	Himachal Pradesh	Chamba	Churah	Churah Division	30	32.82431	76.13964	
8	RV/HP/NL/11 - Protection Model for Natural Regeneration	Himachal Pradesh	Chamba	Churah	Churah Division 1	120	32.82132	76.13958	
	RV/HP/NL/11 - Protection Model for Natural	Himachal Pradesh			Churah Division 2				

9	Regeneration		Chamba	Churah		140	32.82132	76.13958	
10	RV/HP/NL/12 - Fire Protection Model	Himachal Pradesh	Chamba	Dalhousie	Dalhousie Divsion	100	32.53635	75.97077	
11	RV/HP/NL/11 - Protection Model for Natural Regeneration	Himachal Pradesh	Chamba	Dalhousie	Dalhousie Divsion 1	30	32.53838	75.96652	
12	RV/HP/NL/11 - Protection	Himachal	Chamba	Dalhousie	Dalhousie	30	32.53838	75.96652	

Annexure 26: The Geo Co-ordinates and model name of Proposed Forestry Intervention Sites in Natural Landscape of Ravi Riverscape in Jammu & Kashmir UT

Jammu & Kashmir UT Natural Landscape								
Sr. No.	**Model**	**State**	**District**	**Division**	**Sitename**	**Area (ha.)**	**Lat1**	**Long1**
1	RV/JK/NL/08 - Sub-Tropical Dry Deciduous Forest	Jammu & Kashmir	Kathua	Basohli	Madla comp 22/Bsl	20	32.51466	75.82779
2	RV/JK/NL/03 – Temperate Conifer Forest	Jammu & Kashmir	Kathua	Billawar	Dull 22/BLR	11	32.68449	75.6171
3	RV/JK/NL/06 - Himalayan Chir Pine Forest	Jammu & Kashmir	Kathua	Billawar	Khudal Co. 9/BLR	23	32.6728	75.51985
4	RV/JK/NL/08 - Sub-Tropical Dry Deciduous Forest	Jammu & Kashmir	Kathua	Billawar	Rehan Co. 37/BLR	20	32.57353	75.5136
5	RV/JK/NL/10 - Control/ Removal	Jammu &	Kathua	Billawar	Salore	0	32.47011	75.39669

	of Invasive Species or <50% Lantana	Kashmir						
6	RV/JK/NL/08 - Sub-Tropical Dry Deciduous Forest	Jammu & Kashmir	Kathua	Billawar	Shuara, Co 16 b/RKT, Lakhri Beat	20	32.66824	75.42026
7	RV/JK/NL/06 - Himalayan Chir Pine Forest	Jammu & Kashmir	Kathua	Billawar	Tardal, Rajwalta beat, Co. No. 10/RKT	5	32.55368	75.14769
8	RV/JK/NL/09 – Eradication of Lantana (> 50%)	Jammu & Kashmir	Kathua	Kathua	Co- 30 k, Baba Naal	31	32.50363	75.53341
9	RV/JK/NL/08 - Sub-Tropical Dry Deciduous Forest	Jammu & Kashmir	Kathua	Kathua	Co-21k, Kanara	25	32.45228	75.65893
10	RV/JK/NL/09 – Eradication of Lantana (> 50%)	Jammu & Kashmir	Kathua	Kathua	Co-3k, Bindal Naal	10	32.45156	75.48301
11	RV/JK/NL/08 - Sub-Tropical Dry Deciduous Forest	Jammu & Kashmir	Kathua	Kathua	Malni Nalla Bera-1, 83 J	15	32.51056	75.40806
12	RV/JK/NL/08 - Sub-Tropical Dry Deciduous Forest	Jammu & Kashmir	Kathua	Kathua	Sait Nallah 49 J, Khair Beat	10	32.55113	75.40272
13	RV/JK/NL/08 - Sub-Tropical Dry Deciduous Forest	Jammu & Kashmir	Kathua	Kathua	Ujh, Thalla Nallah, Co-26 J	20	32.55806	75.49194
14	RV/JK/NL/10 - Control/ Removal of Invasive Species or <50% Lantana	Jammu & Kashmir	Samba	Samba	Dhruie Beat	15	32.5446	75.1217
15	RV/JK/NL/09 – Eradication of Lantana (> 50%)	Jammu & Kashmir	Samba	Samba	Forest Nursery Blode	5	32.56277	75.16085
16	RV/JK/NL/06 - Himalayan Chir Pine Forest	Jammu & Kashmir	Udhampur	Billawar	Drudi Garh-I Beat, Co.22 / RKT	10	32.70424	75.40488
17	RV/JK/NL/12 - Fire Protection Model	Jammu & Kashmir	Kathua	Basohli	Basohli division	50	32.50382	75.81077
18	RV/JK/NL/11 - Protection Model for Natural Regeneration	Jammu & Kashmir	Kathua	Basohli	Basohli Division 1	60	32.50342	75.81099
19	RV/JK/NL/12 - Fire Protection Model	Jammu & Kashmir	Kathua	Billawar	Billawar Division	50	32.60448	75.60643

20	RV/JK/NL/11 - Protection Model for Natural Regeneration	Jammu & Kashmir	Kathua	Billawar	Billawar Division 1	70	32.61246	75.60419
21	RV/JK/NL/12 - Fire Protection Model	Jammu & Kashmir	Kathua	Kathua	Kathua Division	50	32.38243	75.51847
22	RV/JK/NL/11 - Protection Model for Natural Regeneration	Jammu & Kashmir	Kathua	Kathua	Kathua Division 1	80	32.38461	75.51563
23	RV/JK/NL/12 - Fire Protection Model	Jammu & Kashmir	Samba	Samba	samba division	20	32.54391	75.12578
24	RV/JK/NL/11 - Protection Model for Natural Regeneration	Jammu & Kashmir	Samba	Samba	Samba Division 1	30	32.54543	75.1259
25	RV/JK/NL/11 - Protection Model for Natural Regeneration	Jammu & Kashmir	Samba	Samba	Samba Division 2	20	32.54543	75.1259
26	RV/JK/NL/12 - Fire Protection Model	Jammu & Kashmir	Udhampur	Ramnagar	Ramnagar Division	20	32.7376	75.4169
27	RV/JK/NL/11 - Protection Model for Natural Regeneration	Jammu & Kashmir	Udhampur	Ramnagar	Ramnagar Division 1	30	32.7376	75.4169
28	RV/JK/NL/11 - Protection Model for Natural Regeneration	Jammu & Kashmir	Udhampur	Ramnagar	Ramnagar Division 2	30	32.7376	75.4169

Annexure 27: The Geo Co-ordinates and model name of Proposed Forestry Intervention Sites in Natural Landscape of Ravi Riverscape in Punjab

Punjab Natural Landscape								
Sr.No	**Model**	**State**	**District**	**Division**	**Sitename**	**Area (ha.)**	**Lat1**	**Long1**
1	RV/PB/NL/02 – Road Side Plantation	Punjab	Amritsar	Amritsar	Bhindi Aulakh	8	31.82512	74.59612
2	RV/PB/NL/02 – Road Side Plantation	Punjab	Amritsar	Amritsar	Ghoga	9	31.89299	74.73692

3	RV/PB/NL/02 – Road Side Plantation	Punjab	Amritsar	Amritsar	Gulgarh	8	31.87546	74.643
4	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Amritsar	Amritsar	Hashampura	6	31.86078	74.65024
5	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Amritsar	Amritsar	Jagdev Khurd	7	31.90493	74.74831
6	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Amritsar	Amritsar	Jagdev Khurd	5	31.90493	74.74831
7	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Amritsar	Amritsar	Jhunj	9	31.84123	74.6113
8	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Amritsar	Amritsar	Kohali	6	31.99271	75.00552
9	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Amritsar	Amritsar	Ramdas	6	31.96539	74.90898
10	RV/PB/NL/02 – Road Side Plantation	Punjab	Amritsar	Amritsar	Sarangdev	5	31.88254	74.70152
11	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Adi Bandh 0 to 9.5	6	32.10329	75.26359
12	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Ali Nangal	40	32.12474	75.34769
13	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Batala Bus Stand to Misharpur	8	32.03679	75.07077
14	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Batala to Khanuwan road 0-4 B/S	6	32.04378	75.09305
15	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Batala to Qadian road	6	31.99271	75.00552
16	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Baupu Band	7	32.13248	75.3362
17	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Baupur Afgana to Nurpur Thel	6	32.08676	75.25611

18	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Baupur Jattan	5	32.13768	75.34961
19	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Chakraja	6	32.12568	75.32665
20	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Chauntra, Dinanagar	6	32.1362	75.2858
21	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Chitti	5	32.14571	75.35238
22	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Choura kalan	5	32.25028	75.51694
23	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Dharamkot Randhawa to Ravi Dasya	6	32.02962	74.97
24	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Dharamkot to Shampur Road	8	31.97316	74.92017
25	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Dher	8	32.03748	75.03251
26	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Dinanagar awaraness park	6	32.14605	75.47151
27	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Dinanagar to Taragarh road Km 0 to 5 B/S	6	32.14605	75.47151
28	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Dinanagar to Taragarh road to village Bharth road	8	32.15665	75.47044
29	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Dorangla	5	32.10809	75.30166
30	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Dugri	7	32.09237	75.28762
31	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Faridpur	8	32.14888	75.34688
32	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	G.P Bohal Wadala	5	32.07111	75.20917

33	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	G.P chandu Wadcela	5	32.09633	75.24963
34	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	G.P Chora kalan	8	32.0775	75.23472
35	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	G.P Monanpur	7	32.04389	75.09583
36	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	G.P Rodana	6	32.14733	75.47157
37	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	G.P Rosa	7	32.06556	75.13111
38	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	G.P Shuhar Kalan	5	32.06639	75.19917
39	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	G.P Shuhar Kalan	6	32.06639	75.19917
40	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	G.P. Jhabkara	6	32.16054	75.3637
41	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	G.P. Bahmani	6	32.15389	75.38503
42	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	G.P. Bahmani	6	32.15389	75.38503
43	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Gahlri	8	32.12766	75.33578
44	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Galhari	5	32.13858	75.33383
45	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Gola Dhola to Abaad Post	8	32.02565	74.98683
46	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	GP Balim	6	32.05917	75.13278
47	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	GP Brilan Khurd	5	32.05833	75.14194

48	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	GP Dhindowal	5	32.06306	75.13722
49	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	GP Gaddian Kalan	6	32.07694	75.22667
50	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	GP Marara	5	32.178	75.3945
51	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	GP Masana	7	32.07722	75.23728
52	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Gram panchayat dostpur	6	32.07194	75.21028
53	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	II-R Minor (Railway Station to Shehjada Pind)	6	32.01968	75.01498
54	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Islampur	10	32.12502	75.30484
55	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Jainpur Band	6	32.15223	75.35075
56	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Jhabkra to Tanda Rd b/s	6	32.16037	75.36382
57	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Jogar	8	32.14752	75.37459
58	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Kahna	6	32.15593	75.34449
59	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Khushipur	5	32.11647	75.3199
60	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Lallowal	8	32.045	74.9413
61	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Link Road From DBN Road to Alawazpur	8	32.04709	75.10721
62	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Link Road Shampur to Kot Gurbaksh	8	31.98197	74.92794

63	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Magar Mudian	9	32.11869	75.35222
64	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Mallian Faikhira	8	32.11231	75.33301
65	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Marara to Makro Road	6	32.1774	75.38617
66	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Mirjapur	9	32.14348	75.29632
67	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Munjwal Jungle	10	32.17413	75.33195
68	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Naushehra	6	32.12675	75.32172
69	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Nomni Drain Shahpur Pull to Darmabad village	6	31.99008	74.93252
70	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Pakiwa	9	32.05833	75.12528
71	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Raduaina to Bohar Wadal	5	32.0687	75.171
72	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Ratrar Chattar to Dharamkot Randhawa	6	32.01663	74.98183
73	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Ratta Distributry	6	31.99486	74.91273
74	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Ravi Dhusi Upper Rd 0-30 B/S	5	32.13329	75.33652
75	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Ravi Dhusi Upper Rd 0-30 B/S	5	32.13329	75.33652
76	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Sangor	7	32.12601	75.31758
77	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Sh. Rampur Block Dorangala	6	32.15247	75.33027

78	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Sultani	9	32.12868	75.36207
79	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Tajpur	8	32.11362	75.31042
80	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Talwandi Hinduan	5	32.02668	75.01589
81	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Tanda Band	6	32.16526	75.35435
82	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Thakarpur Band	5	32.1502	75.32492
83	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Thathi	7	32.14836	75.34143
84	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Ugra	0.354	32.15889	75.35189
85	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Vill Adi to Vill Aluna	5	32.09099	75.264
86	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Vill Choura Kalan to Choura Khurd	6	32.07662	75.23631
87	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Vill Dorangla Road to Vill Islampur Link Road	6	32.11723	75.30595
88	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Vill dorangla Road to vill Shapur Link road	6	32.10988	75.2983
89	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Vill Dorangla Road to Vill Shapur Link road	5	32.10988	75.2983
90	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Vill Dostpur to Bohar Wadala	5	32.06846	75.20995
91	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Vill Noushehra to Vill Islampur Link Road	6	32.12764	75.32866
92	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Vill Sangorh to Choundra Road	5	32.12206	75.31765

93	RV/PB/NL/02 – Road Side Plantation	Punjab	Gurdaspur	Gurdaspur	Vill-Dostpur to vill-kamalpur Jattan	6	32.07409	75.20998
94	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Gurdaspur	Gurdaspur	Wazirpur Afgana	6	32.1266	75.30451
95	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Pathankot	Pathankot	UP & sec-4, (sukret salai)	20	32.39693	75.7676
96	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Pathankot	Pathankot	P 11 Bansipur c-1, c-2	20	32.40176	75.74917
97	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Pathankot	Pathankot	UP & sec-4, Arvelli	20	32.39128	75.70656
98	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Pathankot	Pathankot	UP & sec-4, chara jhikla	20	32.40921	75.7514
99	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Pathankot	Pathankot	UP & sec-4, Dalla	20	32.41388	75.79201
100	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Pathankot	Pathankot	UP & sec-4, kot	20	32.38555	75.73201
101	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Pathankot	Pathankot	UP & sec-4, Sukret Salai	20	32.40921	75.7514
102	RV/PB/NL/01 - Restoration of Degraded Forests Model	Punjab	Pathankot	Pathankot	UP & see 4 Matti	20	32.39232	75.73758

Annexure 28: The Geo Co-ordinates and model name of Proposed Forestry Intervention Sites in Soil and Moisture Conservation of Ravi Riverscape in Himachal Pradesh

Sr. No	Model	State	District	Division	Sitename	Range	Block	Beat	Area (m^3)	Lat	Long	Ele (m)
1	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Aliduram Ghar	swai	chanouta	Quaresi	02 model-400m^3 03 model-500m^3	32.50222	76.60722	2445

2	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Banuli Nali	swai	Garola	Ullansa	02 model-500 m^3 03 model-500 m^3	32.485	76.56667	2042
3	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Barnot Ghar	swai	chanhouta	karer	02 model-500 m^3 03 model-500 m3	32.42306	76.58444	2438
4	RV/HP/CI/02	Himachal Pradesh	Chamba	Bharmour	Chaled Ghar	Bharmour	Bharmour	Gnarau	02 model-681 m^3	32.43814	76.53351	2248
5	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Chihani Nalla	Bharmour	Sandi	Chobia	02 model-550 m^3 03 model-500 m^3	32.47063	76.57473	2761
6	RV/HP/CI/02 & 03	Himachal mPradesh	Chamba	Bharmour	Darola Ghar	swai	Runuh Kotli	ghator	02 model-528 m^3 03 model-300 m^3	32.64806	6.54306	1417
7	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Dhad Ghar	swai	Garola	Ullansa	02 model-480 m^3 03 model-250 m^3	32.52361	76.64972	1972
8	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Dhuwan Nalla	Bharmour	Bharmour	Siunr	02 model-360 m^3 03 model-230 m^3	32.55833	76.49606	1837
9	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Ghera Ghar	swai	chanhouta	Karer	02 model-320 m^3 03 model-200 m^3	32.47278	76.50472	2346
10	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Ghudeth Ghar	swai	Runu kothi	Runukothi	02 model-212 m^3 03 model-300 m^3	32.58833	76.51778	1364
11	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Gurmuhi Nalla	Bharmour	sandi	Sirdi	02 model-350 m^3 03 model-300 m^3	2.44209	76.52636	2283
12	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Khani Ghar	swai	Garola	Garola	02 model-290 m^3 03 model-200 m^3	32.44536	76.46703	
13	RV/HP/CI/02 & 03	Himachal	Chamba	Bharmour	Khil Ghar	swai	chanouta	Quaresi	02 model-200 m^3 03	32.4	76.63917	2120

		Pradesh							model-300 m^3			
14	RV/HP/CI/02	Himachal Pradesh	Chamba	Bharmour	Kila ghar	Swai	Garola	Swai	02 model-365 m^3	32.44082	76.46971	1446
15	RV/HP/CI/02	Himachal Pradesh	Chamba	Bharmour	Kuthed Ghar	swai	chanhouta	chanhouta	02 model-112.5m^3	32.43714	76.52966	2322
16	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Looni Ghar	swai	chanhuta	chanhuta	02 model-340 m^3 03 model-300 m^3	32.38972	76.64444	1631
17	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Luna Nalla	swai	Runukotri	Aura	02 model-334 m^3 03 model-500 m^3	32.58139	76.6075	1441
18	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Mether Ghar	Bharmour	Sandi	Sirdi	02 model-301 m^3 03 model-300 m^3	32.44127	76.5266	2321
19	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Naghali Nalla	Bharmour	Bharmour	Chobia	02 model-300 m^3 03 model-300 m^3	32.49278	76.66417	1870
20	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Nyatod Ghar	swai	Garola	Swai	02 model-300 m^3 03 model-300 m^3	32.44087	76.47034	1469
21	RV/HP/CI/02	Himachal Pradesh	Chamba	Bharmour	Oat Nalla	Bharmour	Sandi	Sirdi	02 model-256 m^3	32.55611	76.63889	1699
22	RV/HP/CI/02	Himachal Pradesh	Chamba	Bharmour	Odi Ghar	Bharmour	Sandi	Sirdi	02 model-300 m^3	32.44811	76.54548	1721
23	RV/HP/CI/02	Himachal Pradesh	Chamba	Bharmour	Panchayat Ghar	swai	Garola	Garola	02 model-309 m^3	32.44379	76.46267	
24	RV/HP/CI/02	Himachal Pradesh	Chamba	Bharmour	Panihar	Swai	Garola	Garola	02 model-450 m^3	32.44317	76.46119	

25	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Bharmour	Retta Ghar	swai	Garola	Garola	02 model-350 m^3 03 model-300 m^3	32.44842	76.46436	
26	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Aate	Upper Chamba	Khundel	Almi	01 model-160 m^3 02 model-150 m^3 04 model-500 m^3	32.55667	76.3525	
27	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Almi Ghar	Upper Chamba	Khundel	Almi	02 model-450 m^3 03 model-550 m^3	32.54667	76.38417	
28	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Almi Ghart	Upper Chamba	Khundel	Almi	02 model-400 m^3 03 model-500 m^3	32.54722	76.3775	
29	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Atala Nalla	Upper Chamba	Bakani	Kalandra	02 model-500 m^3 03 model-550 m^3	32.48556	76.24556	
30	RV/HP/CI/01,02 ,03& 05	Himachal Pradesh	Chamba	Chamba	Baddi Nalla	Masrond	Pukhri	Taryodi	01 model-140 m^3 02model-200m^3 03 model-300 m^3 05 model-120 m^3	32.85389	76.05225	
31	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Badel DPF	Upper Chamba	Chhatari	Chhatari	02 model-500 m^3 03 model-500 m^3	32.44333	76.38417	2520
32	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Baindhali Nalla	Lower chamba	chamba	Gudda	01 model-160 m^3 02 model-300 m^3 04 model-560 m^3	32.5192	76.21884	2368
33	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Banei Nalla	Upper Chamba	Kundi	Darkund	02 model-500 m^3 03 model-500 m^3	32.44806	76.28667	
34	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Batnu	Upper Chamba	Kundi	Darkund	02 model-500 m^3 03 model-500 m^3	32.44278	76.28667	

35	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Batot Nalla-1	Upper Chamba	Khundel	Beij	02 model-600 m^3 03 model-200 m^3	32.49861	76.36167	
36	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Batot Nalla-2	Upper Chamba	Khundel	Beij	02 model-662 m^3 03 model-300 m^3	32.49417	76.35028	
37	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Bedhan Gotha Nalla	Lower chamba	Saho	Kaded	02 model-720 m^3 03 model-300 m^3	32.50256	76.10461	
38	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Bhadhor DPF	Upper Chamba	Chhatari	Gehra	02 model-890 m^3	32.48333	76.35806	1370
39	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Bhadra	Upper Chamba	Khundel	Almi	02 model-765 m^3	32.52028	76.37139	
40	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Bhadruni	Upper Chamba	Khundel	Almi	02 model-702 m^3	32.5175	76.37889	
41	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Bhaled Nalla Ghar	Tikri	Jassour Garh	Deola	01 model-140 m^3 02 model-350 m^3 04 model-600 m^3	32.73528	76.20917	1930
42	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Bharala	Upper Chamba	Kundi	Brehi	02 model-585 m^3 03 model-300 m^3	32.56664	76.09997	
43	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Bhatal DPF	Lower chamba	Silla	Silla	01 model-190 m^3 02 model-350 m^3 04 model-550 m^3	32.65944	76.21361	
44	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Bhatalwan Nalla	Lower chamba	chamba	Sorodi	01 model-170 m^3 02 model-300 m^3 04 model-590 m^3	32.55185	76.12373	840

45	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Bhatera	Upper Chamba	Kundi	Kalwara	02 model-556 m^3 03 model-395 m^3	32.45889	76.23	
46	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Bhriyan Nalla	Lower chamba	chhabaru	Bhalka	01 model-170 m^3 02 model-600 m^3 04 model-580 m^3	32.49394	76.14379	1485
47	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Bhulki Nalla	Lower chamba	chamba	Gudda	01 model-150 m^3 02 model-290 m^3 04 model-570 m^3	32.52917	76.20128	2310
48	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Bohndera Nalla	Upper Chamba	Kundi	Darkund	02 model-559 m^3 03 model-500 m^3	32.42306	76.27444	
49	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Brehi Nalla	Upper Chamba	Kundi	Brehi	02 model-520 m^3 03 model-500 m^3	32.56664	76.09997	
50	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	chaddar Nalla	Lower chamba	chamba	Lower Jamuhar	02 model-489 m^3 03 model-500 m^3	32.56278	76.1675	1697
51	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Chali Nalla	Masrond	Masrond	Kahal	02 model-580 m^3 03 model-489 m^3			
52	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Chaloe Nalla	Tikri	Thalli	Nagni	02 model-496 m^3 03 model-500 m^3	32.83698	76.21275	
53	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	chandeli Nalla	Masrond	Masrond	Masrond	01 model-190 m^3 02 model-320 m^3 04 model-600 m^3	32.695	76.17194	1533
54	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Chandroni Dhar	Upper Chamba	Khundel	Almi	01 model-150 m^3 02 model-334 m^3 04 model-520 m^3	32.56194	76.38389	

55	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Chandruni Dhar Nalla	Upper Chamba	Khundel	Almi	02 model-545 m^3 03 model-500 m^3	32.55111	76.37722	
56	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Changtana Nalla	Upper Chamba	Khundel	Lylh	02 model-512 m^3 03 model-550 m^3	32.49994	76.27519	
57	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Chehla	Upper Chamba	Bakani	Loa	02 model-623 m^3 03 model-300 m^3	32.47333	76.18889	
58	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	chhakernd Nalla	Lower chamba	Saho	Saho	02 model-500 m^3 03 model-550 m^3	32.58687	76.28059	
59	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Chho Nalla	Lower chamba	chamba	Gudda	02 model-596 m^3 03 model-250 m^3	32.52889	76.17889	1508
60	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Chiridi Nalla	Upper Chamba	Bakani	Bakani	02 model-360 m^3 03 model-500 m^3	32.47111	76.21111	
61	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Chodri Ghar	Lower chamba	chamba	Gudda	02 model-450 m^3 03 model-500 m^3	32.53348	76.18167	1652
62	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Chou Nalla	Upper Chamba	Kundi	Kundi	02 model-590 m^3 03 model-300 m^3	32.47056	76.29111	
63	RV/HP/CI/01,02,03 & 05	Himachal Pradesh	Chamba	Chamba	Dand Nalla	Masrond	Masrond	Dusli	01 model-150 m^3 02model-200 m^3 03 model-300 m^3 05 model-100 m^3	32.71806	76.29556	1692
64	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Danthe	tuni	chanju	chanju	02 model-600 m^3 03 model-300 m^3	32.71523	76.28017	1669
65	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Darkund Nalla	Upper Chamba	Kundi	Darkund	02 model-718 m^3	32.42111	76.27583	

66	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Dawari DPF	Tikri	chanju	Sundri	02 model-400 m^3	32.73167	76.25028	
67	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Dehra DPF	tuni	chanju	chanju	02 model-489 m^3 03 model-250 m^3	32.71748	76.28522	1797
68	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Deothed DPF	Tikri	Thalli	Bera	02 model-330 m^3 03 model-250 m^3	32.69306	76.35167	
69	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Dhandi DPF	Lower chamba	Saho	chulla	02 model-450 m^3 03 model-150m3	32.58616	76.2	
70	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Dhanuie Nalla	Masrond	Masrond	Masrond	02 model-290m3 03 model-250 m^3	32.65579	76.13421	
71	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Dhar Milgu	tuni	chanju	chanju	01 model-150 m^3 02 model-300 m^3 04 model-600 m^3	32.71547	76.28268	1689
72	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Dhar Nalla	Lower chamba	Saho	Saho	02 model-240 m^3 03 model-262 m^3	32.59601	76.00808	
73	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Dugga Nalla	Upper Chamba	Kundi	Darkund	02 model-480 m^3 03 model-200 m^3	32.39667	76.28667	
74	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Fadgryam	Lower chamba	chhabaru	Bhalka	01 model-160 m^3 02 model-300 m^3 04 model-570 m^3	32.52509	76.14037	896
75	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Gadtri	Tikri	Thalli	Thalli	01 model-160 m^3 02 model-300 m^3 04 model-560 m^3	32.80057	76.17242	2043

76	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Gaggal Nalla	Masrond	Pukhri	cheklao	02 model-370 m^3 03 model-300 m^3	32.80389	76.35528	767
77	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Ganderu DPF	Lower chamba	Silla	Dhar	02 model-350 m^3 03 model-300 m^3	32.63387	76.2289	
78	RV/HP/CI/01,02,03 & 05	Himachal Pradesh	Chamba	Chamba	Ganna Nalla	Lower chamba	chamba	Gudda	01 model-160 m^3 02model-200 m^3 03 model-300 m^3 05 model-120 m^3	32.53833	76.18917	2058
79	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Ganodi kuhala Nalla	Masrond	Chhatri	saloh	01 model-150 m^3 02 model-300 m^3 04 model-590 m^3	32.97444	76.32444	1187
80	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Gharat Nalla	Masrond	Pukhri	Ghargran	02 model-495 m^3 03 model-299 m^3	32.70583	76.21444	1692
81	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Ghari	Upper Chamba	Kundi	Darkund	02 model-370 m^3 03 model-300 m^3	32.44361	76.2975	
82	RV/HP/CI/01,02,03 & 05	Himachal Pradesh	Chamba	Chamba	Gharmani Nalla	Lower chamba	chamba	Gudda	01 model-200 m^3 02model-200 m^3 03 model-300 m^3 05 model-120 m^3	32.53944	76.03139	2132
83	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Ghatet Nalla	Lower chamba	chhaabaru	kaded	02 model-280 m^3 03 model-300 m^3	32.52583	76.102	1334
84	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Ghnletha	Upper Chamba	Bakani	Mehla	02 model-510 m^3	32.48098	76.17765	
85	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Godal SC Work	Bhalei	Bhunad	Smah	02 model-200 m^3 03 model-245 m^3	32.63873	75.96097	1350

86	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Gohanana	Upper Chamba	Bakani	Mortu	02 model-370 m^3 03 model-300 m^3	32.4864	76.17291	
87	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Gurend Nalla	Masrond	Masrond	Masrond	02 model-300 m^3 03 model-300 m^3	32.69056	76.21333	1359
88	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Guwadi Nalla	Upper Chamba	Khundel	Almi	02 model-390 m^3	32.52778	76.35833	
89	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Guwan	Upper Chamba	Kundi	Kundi	02 model-300 m^3	32.46083	76.27444	
90	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Guwari	Upper Chamba	Khundel	Beij	02 model-539 m^3 03 model-300 m^3	32.49556	76.36222	
91	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Hullu Nalla	Lower chamba	chhaabaru	chhaabaru	01 model-190 m^3 02 model-290 m^3 04 model-600 m^3	32.51639	76.14222	1074
92	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Hurad Nalla	Upper chamba	chhabour	Dadra	02 model-300 m^3 03 model-300 m^3	32.49394	76.14379	1485
93	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Jandrah Nalla	Masrond	Masrond	Kahal	01 model-170 m^3 02 model-300 m^3 04 model-580 m^3	32.85583	76.2125	2072
94	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Jhalla Nalla	Lower chamba	chamba	Gudda	02 model-250 m^3 03 model-250 m^3	32.52944	76.17861	1514
95	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Jured R.F	tuni	chanju	Baghei	02 model-150 m^3 03 model-300 m^3	32.73811	76.28972	
96	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Kadoh Nalla	Masrond	Masrond	Masrond	02 model-270 m^3 03 model-250 m^3	32.71556	76.0925	1339

97	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Kalha Nalla	Masrond	Chhatri	kalhel	01 model-160 m^3 02 model-300 m^3 04 model-600 m^3	32.73273	76.12516	
98	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Kalhoon Nalla	Lower chamba	chamba	Lower chamba	02 model-250 m^3 03 model-250 m^3	32.55639	76.18111	1680
99	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Kali Nalla	Lower chamba	chamba	Lower chamba	02 model-400 m^3 03 model-250 m^3	32.56823	76.18338	1829
100	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Kalouns Nalla	UpperChamba	Khundel	Almi	01 model-180 m^3 02 model-300 m^3 04 model-580 m^3	32.53722	76.37083	
101	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Kalwara Nalla	Upper Chamba	Kundi	Kalwara	02 model-290 m^3 03 model-300 m^3	32.43639	76.25194	
102	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Kamotha Nalla	Masrond	Masrond	Dugli	02 model-310 m^3 03 model-300 m^3	32.82639	76.16806	1781
103	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Kandlu DPF	Upper Chamba	Chhatari	Tarouni	02 model-220 m^3 03 model-263 m^3	32.41667	76.32278	
104	RV/HP/CI/01,02,03 & 05	Himachal Pradesh	Chamba	Chamba	Kankot Nalla	Upper Chamba	Kundi	Kalwara	01 model-160 m^3 02model-200 m^3 03 model-300 m^3 05 model-110 m^3	32.41028	76.24417	
105	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Karnani	Upper Chamba	Kundi	Kundi	02 model-445 m^3	32.45306	76.28056	
106	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Karpok Nalla	Upper Chamba	Bakani	Bakani	02 model-240 m^3 03 model-240 m^3	32.4225	76.22306	

107	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Kathwar DPF	Tikri	chanju	Nagni	02 model-200 m^3 03 model-250 m^3	32.75861	76.37472	
108	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Khajua Nalla	Tikri	Thalli	Bera	02 model-220 m^3 03 model-250 m^3	32.83654	76.24469	
109	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	khandiyaru Nalla	Upper Chamba	Khundel	Almi	02 model-150 m^3	32.55667	76.3525	
110	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Kharta	Upper Chamba	Khundel	Almi	01 model-190 m^3 02 model-300 m^3 04 model-590 m^3	32.55778	76.39556	
111	RV/HP/CI/01,02	Himachal Pradesh	Chamba	Chamba	Khirkal	Upper Chamba	Khundel	Almi	01 model-110 m^3 02 model-300 m^3 04 model-580 m^3	32.52028	76.40083	
112	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Kholi Garat Nalla	Upper Chamba	Bakani	Kalanora	02 model-310 m^3	32.48389	76.25028	
113	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Kiratot Nalla	Tikri	Thalli	Nagni	01 model-160 m^3 02 model-300 m^3 04 model-580 m^3	32.8366	76.22466	1620
114	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Kuiel Nalla	Masrond	Masrond	Kahal	02 model-245 m^3	32.91194	76.11889	1242
115	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Kunaloth DPF	Tikri	Jassour Garh	Tikri	01 model-160 m^3 02 model-300 m^3 04 model-600 m^3	32.79132	76.20336	1888
116	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Kunr	Upper Chamba	Chhatari	Chhatari	02 model-200 m^3 03 model-245 m^3	32.41639	76.36194	2980

117	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Chamba	Kuthed Nalla	Masrond	Masrond	Kahal	01 model-160 m^3 02 model-300 m^3 04 model-600 m^3	32.73724	76.10812	988
118	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Lamba Ghot Nalla	Lower chamba	chamba	Gudda	02 model-220 m^3	32.51962	76.21344	2283
119	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Lamba Nalla	Upper Chamba	Kundi	Darkund	02 model-410 m^3	32.40361	76.28889	
120	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Lamdal Nalla	Upper Chamba	Kundi	Darkund	02 model-555 m^3	32.37194	76.2975	
121	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Lanjna Nalla	Tikri	Thalli	Bera	02 model-415 m^3 03 model-300 m^3	32.83965	76.23592	
122	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Lohduhie Nalla	Masrond	Pukhri	Taryodi	02 model-325 m^3 03 model-250 m^3	32.84417	76.19167	1140
123	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Lothal	Upper Chamba	Kundi	Kundi	02 model-376 m^3	32.47222	76.305	
124	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Luna Chuchian	Upper Chamba	Chhatari	Chhatari	02 model-300 m^3 03 model-231 m^3	32.45139	76.38722	
125	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Makroti	Upper Chamba	Chhatari	Tarouni	02 model-266 m^3 03 model-231 m^3	32.42472	76.32833	
126	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Maleha Nalla	Upper Chamba	Khundel	Lylh	02 model-100 m^3 03 model-300 m^3	32.48278	76.29833	
127	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Malla Nalla	Lower chamba	chamba	Lower chamba	02 model-345 m^3 03 model-250 m^3	32.56028	76.18083	1679

128	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Mandhara DPF	Upper Chamba	Chhatari	Tarouni	02model=483.5m^3	32.43528	76.32083	
129	RV/HP/CI/01,02,03 & 05	Himachal Pradesh	Chamba	Chamba	Marali Mata Nalla	Upper Chamba	Kundi	Kalwara	01 model-160 m^3 02model-200 m^3 03 model-300 m^3 05 model-120 m^3	32.44861	76.22861	
130	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Marotha	Upper Chamba	Kundi	Darkund	02 model-305 m^3	32.46889	76.28917	
131	RV/HP/CI/01,02,03 & 05	Himachal Pradesh	Chamba	Chamba	Marror DPF	Upper Chamba	Chattrori	Gehra	01 model-180 m^3 02model-200m3 03 model-300 m^3 05 model-110 m^3	32.44111	76.35778	2200
132	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Mehla Nalla	Upper Chamba	Bakani	Mehla	02 model-550 m^3 03 model-300 m^3	32.47817	76.18403	
133	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Miyadi DPF Miuari Nalla	Lower chamba	chamba	Gudda	02 model-443 m^3 03 model-300 m^3	32.53	76.07694	1766
134	RV/HP/CI/01,02,03 & 04	Himachal Pradesh	Chamba	Chamba	Nagali Nalla	Lower chamba	chhaabaru	chhaabaru	01 model-170 m^3 02model-100 m^3 03 model-200 m^3 04 model-570 m^3	32.48917	76.13806	
135	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Chamba	Nangal Nalla	Lower chamba	chamba	Sorodi	01 model-150 m^3 02model-60 m^3 04 model-580 m^3	32.54444	76.11333	1070
136	RV/HP/CI/01,02,03 & 05	Himachal Pradesh	Chamba	Chamba	Padeda Nalla	Lower chamba	chhubaru	Kharadnda	01 model-70 m^3 02model-300 m^3 03 model-300 m^3 05	32.50667	76.08444	

									model-120 m^3			
137	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Palei Nalla	Upper Chamba	Kundi	Darkund	02 model-450 m^3	32.43722	76.29083	
138	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Pangluie Nalla	Masrond	Masrond	Kahal	02 model-300 m^3	32.91028	76.23083	1468
139	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Chamba	Parnoti Nalla	Lower chamba	chamba	Lower Jamuhar	01 model-150 m^3 02model-300 m^3 04 model-590 m^3	32.55689	76.17531	1627
140	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Piuranalla	Upper Chamba	Chattrari	Gehra	02 model-200 m^3 03 model-500 m^3	32.43361	76.33667	1500
141	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Prana Nalla	Tikri	Thalli	Bera	02 model-530 m^3	32.84388	76.26195	
142	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Chamba	R.F-Kalwala	Tikri	Thalli	Kalwala	01 model-190 m^3 02model-300 m^3 04 model-580 m^3	32.82106	76.16641	
143	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Rajola Nalla	Lower chamba	Saho	sara	02 model-250 m^3 03 model-240 m^3	32.76694	76.35833	2114
144	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Rang Ghar	Upper Chamba	Kundi	Kundi	02 model-339 m^3 03 model-250 m^3	32.475	76.30528	
145	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Runi Di Ghar	Lower chamba	chhabour	Kharad nda	02 model-320 m^3 03 model-300 m^3	32.49889	76.07861	1826
146	RV/HP/CI/01,02,03 & 05	Himachal Pradesh	Chamba	Chamba	Sadoon Nalla	Upper Chamba	Kundi	Darkund	01 model-140 m^3 02model-200 m^3 03 model-300 m^3 05	32.43528	76.28806	

									model-120 m^3			
147	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Sahloi Nalla	Lower chamba	Saho	Saho	02 model-350 m^3 03 model-238 m^3	32.58196	76.27233	
148	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Sahluin Nalla	Upper Chamba	Bakani	Bakani	02 model-300 m^3 03 model-250 m^3	32.46833	76.21556	
149	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Sakral Nalla	Upper Chamba	Kundi	Brehi	02 model-400 m^3	32.46278	76.31861	
150	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Chamba	Saloh	Masrond	Chhatri	seloh	01 model-800 m^3 02model-300 m^3 04 model-600 m^3	32.73994	76.109	883
151	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Sanera Nalla	Masrond	Masrond	Dugli	02 model-339 m^3 03 model-300 m^3	32.78528	76.26056	1643
152	RV/HP/CI/01,02,03 & 05	Himachal Pradesh	Chamba	Chamba	Sanged Nalla	Lower chamba	chamba	Gudda	01 model-150 m^3 02model-200 m^3 03 model-250 m^3 05 model-120 m^3	32.52361	76.19778	1617
153	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Saryanu Nalla	Masrond	Masrond	Kandla	02 model-200 m^3	32.68139	76.15111	1411
154	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Satori Ghar	Lower chamba	chamba	Lower chamba	02 model-289 m^3 03 model-170 m^3	32.57556	76.17972	
155	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	satori Nalla	Lower chamba	chamba	Lower Jamuhar	02 model-334 m^3	32.57528	76.18139	1608
156	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Seri Nalla	Lower chamba	chamba	Lower Jamuhar	02 model-460 m^3	32.56472	76.16306	1655

157	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Shakti Dehra Nalla	Masrond	Pukhri	Kiani	02 model-300 m^3	32.76333	76.15722	1587
158	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Shignalla	Tikri	Thalli	Nagni	02 model-350 m^3 03 model-297 m^3	32.83411	76.19939	
159	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Chamba	Shiv Panihar Nalla	Masrond	Pukhri	palei	01 model-170 m^3 02model-300 m^3 04 model-600 m^3	32.64683	76.02754	1198
160	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Chamba	Sohi Nalla	Masrond	Masrond	Kahal	01 model-170 m^3 02model-300 m^3 04 model-580 m^3	32.86417	76.25056	2142
161	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Solehu Nalla	Upper Chamba	Khundel	Lylh	02 model-250 m^3	32.50003	76.29833	
162	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Sounu Di Nalli Ghar	Lower chamba	chamba	Gudda	02 model-290 m^3 03 model-150 m^3	32.53532	76.18408	1798
163	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Chamba	Suked Nalla	Lower chamba	Saho	kiri	02 model-170 m^3 03 model-100 m^3	32.55083	76.41667	
164	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Sukretha Nalla	Masrond	Pukhri	Kandla	02 model-120 m^3	32.7225	76.29278	1805
165	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Chamba	Sultanpur DPF	Lower chamba	chamba	Sorodi	01 model-560 m^3 02model-1100m^3 04 model-1140 m^3	32.48101	76.17442	
166	RV/HP/CI/01 & 2	Himachal Pradesh	Chamba	Chamba	Suniara ghar	Tikri	Jassour Garh	Jassour Garh	01 model-170 m^3 02 model-318 m^3	32.4575	76.16306	
167	RV/HP/CI/01,02& 04	Himachal	Chamba	Chamba	Tapoon DPF	Lower	chamba	Sorodi	01 model-170 m^3	32.52714	76.09611	1388

		Pradesh			chitar	chamba			02model-300 m^3 04 model-600 m^3			
168	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Tara Nalla	Upper Chamba	Kundi	Darkund	02 model-345 m^3	32.42444	76.275	
169	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Thathar Nalla	Masrond	Pukhri	kiani	02 model-300 m^3	32.89778	76.13194	1775
170	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Triya Nalla	Masrond	Masrond	mani	02 model-300 m^3	32.77972	76.19972	2116
171	RV/HP/CI/02	Himachal Pradesh	Chamba	Chamba	Uteep Nalla	Lower chamba	chamba	Lower Jamuhar	02 model-300 m^3	32.56111	76.32139	1467
172	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Nondal Van Sarovar	Tissa	Baira	Mansa	01 model-160 m^3 02model-100 m^3 04 model-600 m^3	44.18061	76.44194	2860
173	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Aadi Da Goth Van Sarovar	Tissa	Tissa	Pugthala	01 model-140 m^3 02model-200 m^3 04 model-550 m^3	32.87403	76.18322	2375
174	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Ajyani Ghar	Himgiri	Khangu	Chilli	02 model-190 m^3 03 model-100 m^3	32.82238	76.08648	4528Ft.
175	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Akhodu Goth Van sarovar	Tissa	Tissa	Pugthala	01 model-150 m^3 02model-200 m^3 04 model-580 m^3	32.87403	76.18322	2375
176	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Andwas Nalla	Tissa	Baira	Shoul	02 model-200 m^3	32.89514	76.11816	1856
177	RV/HP/CI/02 & 03	Himachal	Chamba	Churah	Baad Nalla	Tissa	Sei	Jangbani	02 model-200 m^3 03	32.85726	76.04115	2248

		Pradesh							model-100 m^3			
178	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Balwas Nalla	Himgiri	Himgiri	Billa	02 model-200 m^3 03 model-120 m^3	32.77074	76.08167	2220
179	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Bandokhi Nalla	Bhalei	Sundla	Salooni	02 model-210 m^3 03 model-110 m^3	32.71646	75.96521	1630
180	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Batoti Ghar	Himgiri	khangu	chundi	02 model-210 m^3 03 model-100 m^3	32.59594	76.02765	1139
181	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Behi Ghar	Himgiri	Khangu	Chilli	02 model-210 m^3 03 model-120 m^3	32.81678	76.08239	5112Ft.
182	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Bhalla Nalla	Tissa	Tissa	Devikothi	02 model-210 m^3 03 model-200 m^3	32.90769	76.23599	2452
183	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Bhalodi Nalla	Himgiri	khangu	Kherna	02 model-210 m^3 03 model-120 m^3	32.83292	76.05057	1606
184	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Bhandar Nalla	Chakoli	Salooni	Manjeer	02 model-220 m^3 03 model-130 m^3	32.7085	76.05214	1003
185	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Bhangi Nalla	Tissa	Baira	Shoul	02 model-200 m^3 03 model-120 m^3	32.89823	76.10527	1678
186	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Bhatiyund Nalla	Chakoli	Salooni	Manjeer	02 model-190 m^3 03 model-300 m^3	32.70161	76.07383	1142
187	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Bhatiyund Nalla	Chakoli	Salooni	Manjeer	02 model-190 m^3 03 model-250 m^3	32.70161	76.07383	1142
188	RV/HP/CI/02	Himachal	Chamba	Churah	Bhootu	Tissa	Tissa	Chandru	02 model-200 m^3	32.92197	76.24488	2177

		Pradesh			Nalla / Ghar							
189	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Bhrikhu Nalla	Tissa	Sei	Gungiyas	02 model-190 m^3	32.88272	76.0723	2949
190	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Bhrikhu Van Sarobar	Tissa	Sei	Gungiyas	01 model-170 m^3 02model-300 m^3 04 model-600 m^3	32.88588	76.08126	2667
191	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Billa Ghar	Himgiri	Himgiri	Billa	02 model-210 m^3 03 model-2000 m^3	32.78447	76.06972	2383
192	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Chamani Nalla	Bhalei	Bhalei	Bhing	02 model-210 m^3 03 model-300 m^3	32.65895	75.96884	1618
193	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Chamwas CA	Himgiri	Khangu	Chilli	02 model-220 m^3 03 model-300 m^3	32.82771	76.09617	4594Ft.
194	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Chandrol Nalla	Himgiri	khangu	Kherna	02 model-220 m^3 03 model-300 m^3	32.82193	76.06607	1594
195	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Chandru Nalla	Tissa	Tissa	Chandru	02 model-230 m^3	32.91924	76.25081	2405
196	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Chanjali Nalla	Tissa	Baira	Shoul	02 model-200 m^3	32.90926	76.14418	1685
197	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Chanjali Nalla	Himgiri	Khangu	Chilli	02 model-100 m^3 03 model-2000 m^3	32.82283	76.11324	4277Ft.
198	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Chanod Nalla	Tissa	Baira	Mansa	02 model-220 m^3 03 model-300 m^3	32.93901	76.16407	1971
199	RV/HP/CI/02 & 03	Himachal	Chamba	Churah	checkwall	Himgiri	khangu	Kherna	02 model-220 m^3 03	32.83435	76.05391	1535

		Pradesh			kherna				model-300 m^3			
200	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Cheen Nall	Bhalei	Bhunad	Badka	02 model-300 m^3 03 model-300 m^3	32.70902	75.94243	1758
201	RV/HP/CI/01,02,03 & 05	Himachal Pradesh	Chamba	Churah	Cheen Nalla WHS	Bhalei	Bhunad	Badka	01 model-180 m^3 02model-200 m^3 03 model-300 m^3 05 model-120 m^3	32.70748	75.93893	1852
202	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	chihalli Ghar	Himgiri	khangu	Ail	02 model-300 m^3	32.83384	76.04504	1672
203	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Chiu Gali	Bhalei	Bhunad	Badka	01 model-180 m^3 02model-200 m^3 04 model-600 m^3	32.72535	75.92935	2252
204	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Chiulli Nalla	Tissa	Sei	Gungiyas	02 model-220 m^3	32.88346	76.1296	1661
205	RV/HP/CI/03	Himachal Pradesh	Chamba	Churah	Cho nalla	Tissa	Tissa	Pugthala	03 model-400 m^3	32.87908	76.19319	2184
206	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Chuidi Nalla	Tissa	Sei	Jangbani	02 model-220 m^3	32.86743	76.01871	2027
207	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Churah Nalla	Bhalei	Sundla	Jund	02 model-100 m^3 03 model-100 m^3	32.71109	75.99713	1647
208	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Daira Nalla	Tissa	Tissa	Chandru	02 model-300 m^3	32.92116	76.24514	2182
209	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Dasyoth nalla	Himgiri	khangu	Kherna	02 model-340 m^3	32.83405	76.05228	1566

210	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Dehru	Bhalei	Bhalei	Wangal	01 model-190 m^3 02model-200 m^3 04 model-570 m^3	32.61722	76.10556	1098
211	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Devikothi Nalla	Tissa	Tissa	Devikothi	02 model-200 m^3	32.91157	76.22741	2602
212	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Dharamshala / Surela Nalla	Bhalei	Bhalei	Bhalei	02 model-220 m^3 03 model-250 m^3	32.63401	75.99689	1175
213	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Dhareendi nalla	Tissa	Tissa	Pugthala	02 model-300 m^3 03 model-300 m^3	32.89861	76.23957	1860
214	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Dibhari CA	Bhalei	Sundla	Salwan	02 model-100m3 03 model-300 m^3	32.73836	75.95135	2706
215	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Dibru Nalla	Bhalei	Sundla	Jund	02 model-100 m^3 03 model-300 m^3	32.71895	75.99613	1693
216	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Domara Van Sarovar	Tissa	Sei	Jangbani	01 model-110 m^3 02model-200 m^3 04 model-580 m^3	32.85875	76.031	2284
217	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Donna Nalla	Tissa	Sei	Sagti	02 model-100 m^3 03 model-300 m^3	32.84261	76.0701	2070
218	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Dudra Dhar	Tissa	Tissa	Tissa	01 model-180 m^3 02model-200 m^3 04 model-600 m^3	32.85889	76.18447	2410
219	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Faglogu Ghar	Himgiri	Khangu	Chilli	02 model-100 m^3 03 model-300 m^3	32.81433	76.10341	5655Ft.

220	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Ganed Nalla	Tissa	Tissa	Tissa	02 model-200 m^3	32.8433	76.19058	1671
221	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Gatti Nalla	Bhalei	Bhunad	Bhunad	02 model-210 m^3 03 model-300 m^3	32.69587	75.90781	1444
222	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Ghahua SC Work	Bhalei	Bhunad	Smah	02 model-210 m^3 03 model-2000 m^3	32.64559	75.93547	745
223	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Ghaliyali Ghara /Nalla	Tissa	Tissa	Pugthala	02 model-200 m^3 03 model-250 m^3	32.8775	76.22906	2354
224	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Gharat Nalla	Bhalei	Sundla	Sundla	02 model-100 m^3 03 model-250 m^3	32.70831	76.04137	1137
225	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Ghari Panihar	Bhalei	Sundla	Salwan	01 model-170 m^3 02model-200 m^3 04 model-600 m^3	32.70651	75.95923	1870
226	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Ghori The Goth	Tissa	Tissa	Chandru	01 model-180 m^3 02model-300 m^3 04 model-580 m^3	32.85306	76.25944	2830
227	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Goonu Nalla	Bhalei	Bhalei	Bhalei	02 model-250 m^3 03 model-250 m^3	32.62928	75.98016	1517
228	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Goth Nalla	Bhalei	Bhunad	Badka	02 model-140 m^3 03 model-300 m^3	32.71468	75.94994	2075
229	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Gothdu	Tissa	Sei	Jangbani	01 model-190 m^3 02model-200 m^3 04 model-600 m^3	32.86128	76.03171	2235

230	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Guddan Nalla	Tissa	Baira	Baira	02 model-100 m^3 03 model-300 m^3	32.89643	76.17302	1509
231	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Gueri Nalla	Tissa	Sei	Gungiyas	02 model-140 m^3 03 model-250 m^3	32.87639	76.13633	1686
232	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Hailar Nalla	Tissa	Sei	Gungiyas	02 model-210 m^3	32.89304	76.06953	2756
233	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Hailar Vansarovar	Tissa	Sei	Gungiyas	01 model-180 m^3 02model-300 m^3 04 model-580 m^3	32.89881	76.08009	2582
234	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Halela Nalla	Himgiri	Himgiri	Billa	02 model-100 m^3 03 model-300 m^3	32.7786	76.06117	1971
235	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Ichlei Nalla	Bhalei	Bhalei	Bhing	02 model-350 m^3 03 model-250 m^3	32.67499	75.94327	1898
236	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Jalai Nalla	Bhalei	Sundla	Jund	02 model-220 m^3 03 model-300 m^3	32.71616	75.99461	1738
237	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Jamed Dhar	Tissa	Sei	Jangbani	02 model-220 m^3 03 model-300 m^3	32.86173	76.03659	2475
238	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Jamoth Nalla	Chakoli	Kihar	Bhadroh	02 model-350 m^3 03 model-300 m^3	32.85806	76.18833	2732
239	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Jamoth Nalla	Chakoli	Kihar	Bhadroh	02 model-200 m^3 03 model-250 m^3	32.85806	76.18833	2732
240	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Janna	Bhalei	Bhunad	Smah	01 model-160 m^3 02model-300 m^3 04	32.62111	75.94363	1542

									model-600 m^3			
241	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Jawalla Ghar	Himgiri	Khangu	Thanella	02 model-200 m^3 03 model-250 m^3	32.83753	76.04118	
242	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Junas Ghara	Tissa	Baira	Mansa	02 model-290 m^3 03 model-200 m^3	32.91626	76.13606	2117
243	RV/HP/CI/01,02,03 & 05	Himachal Pradesh	Chamba	Churah	Juthar Nalla	Bhalei	Bhalei	Bhalei	01 model-180 m^3 02model-200 m^3 03 model-250 m^3 05 model-120m3	32.63804	75.98488	1443
244	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Jyoti Kandha	Tissa	Sei	Sagti	01 model-160 m^3 02model-200 m^3 04 model-560 m^3	32.85778	76.07778	2803
245	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Kalaban	Tissa	Baira	Baira	01 model-190 m^3 02model-200 m^3 04 model-590 m^3	32.90307	76.17377	2367
246	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Kalyani	Himgirir	Himgiri	Himgiri	01 model-160 m^3 02model-200 m^3 04 model-580 m^3	32.79186	76.08674	8447ft.
247	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Kalyani Nalla	Himgirir	Himgiri	Himgiri	02 model-250 m^3 03 model-256 m^3	32.78363	76.08633	7753ft
248	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Kandolu Ghar	Tissa	Sei	Sagti	02 model-220 m^3 03 model-300 m^3	32.82708	76.08491	1641
249	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Kanihandi	Bhalei	Bhunad	Smah	01 model-110 m^3 02model-300 m^3 04 model-600 m^3	32.63641	75.9737	1898

250	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Karwal Nalla	Bhalei	Bhalei	Bhing	02 model-345 m^3 03 model-100 m^3	32.67186	75.94794	1711
251	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Katal Panihar	Bhalei	Sundla	Salwan	01 model-170 m^3 02model-300 m^3 04 model-570 m^3	32.70941	75.95454	1904
252	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Katoga Nalla	Himgiri	Himgiri	Himgiri	02 model-292 m^3 03 model-250 m^3	32.79309	76.11782	6307ft
253	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Kayaharu Goth	Tissa	Tissa	Pugthala	01 model-160 m^3 02model-300 m^3 04 model-560 m^3	32.86953	76.19497	2394
254	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Kehlra Nalla	Tissa	Baira	Baira	02 model-350 m^3	32.89967	76.18269	1997
255	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Keshwani Ghar	Tissa	Sei	Gungiyas	02 model-210 m^3	32.86883	76.13836	1487
256	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	khakhri Ghar	Himgiri	khangu	chundi	02 model-450 m^3 03 model-231 m^3	32.58622	76.01963	1256
257	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	kharat Nalla	Tissa	Baira	Baira	02 model-250 m^3	32.89188	76.1725	1632
258	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Khundi Panihara	Bhalei	Sundla	Salwan	01 model-190 m^3 02model-300 m^3 04 model-600 m^3	32.70259	75.96728	1675
259	RV/HP/CI/01,2& 04	Himachal Pradesh	Chamba	Churah	Khurandi	Tissa	Tissa	Devikothi	01 model-150 m^3 02model-300 m^3 04 model-600 m^3	32.91341	76.22901	2713

260	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Kidwas Nalla	Himgiri	khangu	chundi	02 model-200 m^3 03 model-431 m^3	32.6	76.02546	808
261	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Kolan	Himgiri	Himgiri	Himgiri	01 model-140 m^3 02model-300 m^3 04 model-560 m^3	32.7999	76.11128	7804ft
262	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Kotta Mandarwad Ghar	Himgiri	Himgiri	Billa	02 model-490 m^3	32.77248	76.07951	2226
263	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Kulthod Nalla	Tissa	Sei	zagti	02 model-423 m^3	32.83393	76.10399	1667
264	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Kund Nalla	Bhalei	Sundla	Jund	02 model-365 m^3	32.7015	76.00419	1734
265	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Kundali Nalla	Bhalei	Bhunad	Badka	02 model-433 m^3 03 model-220 m^3	32.7056	75.93558	1988
266	RV/HP/CI/01,02,03 & 05	Himachal Pradesh	Chamba	Churah	Kundali Nalla	Bhalei	Bhunad	Badka	01 model-170 m^3 02model-200 m^3 03 model-300 m^3 05 model-120 m^3	32.70565	75.93691	1870
267	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Kundolu	Tissa	Sei	Jangbani	01 model-150 m^3 02model-300 m^3 04 model-600 m^3	32.85528	76.03233	2253
268	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Kuttlu Nalla	Bhalei	Bhunad	Bhunad	02 model-300 m^3	32.67219	75.91053	1550
269	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Labeda Nalla	Himgiri	Khangu	Chilli	02 model-200 m^3 03 model-100 m^3	32.82133	76.08203	4624Ft.

270	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Ladoon Nalla	Tissa	Sei	Gungiyas	02 model-520 m^3	32.85989	76.10897	2199
271	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Ladrrora Nalla	Himgiri	Khangu	Thanella	02 model-300 m^3 03 model-251 m^3	32.81624	76.08205	5208Ft.
272	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Lamhota Nalla	Himgiri	Himgiri	Himgiri	02 model-300 m^3 03 model-300 m^3	32.79252	76.09193	7474ft
273	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Lamipati Nalla	Tissa	Tissa	Pugthala	02 model-200 m^3 03 model-200 m^3	32.8695	76.19011	
274	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Lampyak Ghar	Himgiri	Khangu	Chilli	02 model-275 m^3 03 model-231 m^3	32.82495	76.09317	4625ft.
275	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Langhed Nalla	Tissa	Sei	Jangbani	02 model-310 m^3 03 model-300 m^3	32.84928	76.04313	1725
276	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Lared Nalla	Himgiri	Himgiri	Himgiri	02 model-255 m^3 03 model-100 m^3	32.78226	76.09021	7333ft
277	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Lingyati Ghar	Tissa	Sei	Jangbani	02 model-350 m^3 03 model-130 m^3	32.85991	76.02535	2008
278	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Luinda Ghar	Tissa	Sei	Gungiyas	02 model-210 m^3	32.86528	76.1055	2359
279	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Luinda Nalla	Tissa	Sei	Gungiyas	02 model-290 m^3	32.86636	76.10725	2385
280	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Maled Nalla Sring (Panihara)	Bhalei	Bhunad	Smah	01 model-190 m^3 02model-300 m^3 04 model-600 m^3	32.62875	75.95583	1311

281	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Malhol Nalla	Himgiri	Himgiri	Billa	02 model-210 m^3 03 model-30 m^3	32.78496	76.09278	2471
282	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Malni	Himgiri	Khangu	Chilli	01 model-170 m^3 02model-300 m^3 04 model-600 m^3	32.7869	76.16009	
283	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Malund Nalla	Tissa	Tissa	Pugthala	02 model-200 m^3 03 model-70 m^3	32.86944	76.21556	2555
284	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Mandoon Ghar	Tissa	Baira	Shoul	02 model-100 m^3	32.89486	76.14808	1487
285	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Mandrani	Bhalei	Sundla	Salwan	01 model-180 m^3 02model-300 m^3 04 model-560 m^3	32.72814	75.96816	2567
286	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Mangli Ghar	Tissa	Baira	Shoul	02 model-330 m^3	32.91361	76.084	1971
287	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Maniyoga Nalla	Himgiri	Himgiri	Billa	02 model-210 m^3 03 model-80 m^3	32.77419	76.06511	2125
288	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Mansa Nalla	Tissa	Baira	Mansa	02 model-200 m^3 03 model-100 m^3	32.93809	76.16367	1974
289	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Mansa	Tissa	Baira	Mansa	01 model-150 m^3 02model-300 m^3 04 model-580 m^3	32.94167	76.16399	1990
290	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Marali	Himgiri	Himgiri	Billa	01 model-190 m^3 02model-300 m^3 04 model-580 m^3	32.7856	76.07368	8446ft

291	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Marali Nalla	Tissa	Tissa	Pugthala	02 model-439 m^3	32.87736	76.197	2446
292	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Marali Nalla	Himgiri	Khangu	Thanella	02 model-480 m^3 03 model-40 m^3	32.80674	76.05693	7261Ft.
293	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Matiyund Nalla	Tissa	Sei	Sagti	02 model-376 m^3	32.85623	76.08883	2325
294	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Mouda Nalla	Bhalei	Sundla	Salwan	02 model-296 m^3 03 model-100 m^3	32.71495	75.95829	1807
295	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Nachnoti Nalla	Himgiri	Himgiri	Billa	02 model-421 m^3 03 model-50 m^3	32.77625	76.08513	2147
296	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Nagani Nalla /Ghar	Himgiri	Khangu	Thanella	02 model-320 m^3	32.80599	76.0418	8449Ft.
297	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Nondal	Tissa	Baira	Mansa	01 model-150 m^3 02model-300 m^3 04 model-580 m^3	32.93732	76.16305	1980
298	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Panjola Nalla	Bhalei	Bhunad	Bhundad	02 model-230 m^3 03 model-100 m^3	32.665	75.91596	1233
299	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Prandari Ghar	Himgiri	Himgiri	Himgiri	02 model-300 m^3 03 model-120 m^3	32.78117	76.11386	6087ft
300	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Pring Closed Area	Chakoli	Kihar	Diur	02 model-230 m^3 03 model-90 m^3	32.75453	76.02194	1796
301	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Ranikot	Tissa	Baira	Baira	01 model-190 m^3 02model-300 m^3 04	32.88946	76.16028	1823

									model-600 m^3			
302	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Rinda Ghar	Himgiri	Khangu	Chilli	02 model-300 m^3	32.82638	76.10376	4471ft.
303	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Rolah Nalla	Bhalei	Sundla	Sundla	02 model-440 m^3	32.68644	76.04231	954
304	RV/HP/CI/01,02& 04	Himachal Pradesh	Chamba	Churah	Rupadi	Tissa	Sei	Jangbani	01 model-190 m^3 02model-220 m^3 04 model-570 m^3	32.86838	76.03188	2254
305	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Gulel Nalla	Chakoli	Kihar	Gulel	02 model-220 m^3	32.88667	76.11028	1845
306	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Gulel Nalla	Chakoli	Kihar	Gulel	02 model-220 m^3 03 model-80 m^3	32.88667	76.11028	1845
307	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Kilod Nalla	Chakoli	Salooni	Kilod	02 model-220 m^3 03 model-90 m^3	32.73694	75.95667	2677
308	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Bhaint Nalla	Chakoli	Panoga	Bhaint	02 model-290 m^3	32.83497	75.89008	1939
309	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Dhaneli Nalla	Chakoli	Panoga	Bhaint	02 model-220 m^3 03 model-30 m^3	32.83497	75.89008	1939
310	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Dhaneli Nalla.	Chakoli	Kihar	Diur	02 model-300 m^3	32.72358	76.05225	
311	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Dhaneli Nalla.	Chakoli	Kihar	Diur	02 model-300 m^3	32.98889	6.13611	1802
312	RV/HP/CI/02	Himachal	Chamba	Churah	Dhaneli	Chakoli	Kihar	Diur	02 model-230 m^3	32.98889	76.13611	1802

		Pradesh			Nalla.							
313	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Drati Nalla	Chakoli	Kihar	Bhadroh	02 model-250 m^3	32.92278	76.04139	2112
314	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Drati Nalla	Chakoli	Kihar	Bhadroh	02 model-220 m^3	32.92278	76.04139	2112
315	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Ghadhetra Nalla	Chakoli	Panoga	Panoga	02 model-310 m^3	32.76708	75.93576	1721
316	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Haluri Nalla	Chakoli	Kihar	Diur	02 model-220 m^3	32.81889	76.17361	1552
317	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	HiyanNalla	Chakoli	Kihar	Gulel	02 model-200 m^3	32.77703	76.10972	1827
318	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Hiyan Nalla	Chakoli	Kihar	Gulel	02 model-220 m^3	32.77703	76.10972	1827
319	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Bhalka Nalla	Chakoli	Panoga	Bhaint	02 model-240 m^3	32.80383	75.90292	1827
320	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Bhidan Nalla	Chakoli	Kihar	Kihar	02 model-320 m^3	32.77314	75.99639	1986
321	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Bhidan Nalla	Chakoli	Kihar	Kihar	02 model-270 m^3 03 model-100 m^3	32.77314	75.99639	1986
322	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Sandra Nalla	Chakoli	Kihar	Kihar	02 model-200 m^3	32.75142	76.15722	1616
323	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Sandra Nalla	Chakoli	Kihar	Kihar	02 model-210 m^3	32.75142	76.15722	1616

324	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Thiyund Ghar/Land Slip	Chakoli	Panoga	Baint	02 model-300 m^3	32.84056	75.87861	2008
325	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Inland Slide / Slips Bhiknar Ghar	Chakoli	Kihar	Diur	02 model-300 m^3	32.90194	76.25472	1528
326	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Kandhwara Nalla	Chakoli	Kihar	Gulel	02 model-230 m^3	32.95694	76.18639	2159
327	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Kandhwara Nalla	Chakoli	Kihar	Gulel	02 model-230 m^3	32.95694	76.18639	2159
328	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Kandolu Nalla	Chakoli	Kihar	Gulel	02 model-240 m^3	32.77683	76.05389	1853
329	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Kandolu Nalla	Chakoli	Kihar	Gulel	02 model-220 m^3	32.77683	76.05389	1853
330	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Manghali Nalla	Chakoli	Panoga	Bhaint	02 model-220 m^3	32.81419	75.89194	2462
331	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Maroth	Chakoli	Panoga	Panoga	02 model-220 m^3 03 model-100 m^3	32.75029	75.93861	2651
332	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Oni Nalla	Chakoli	Panoga	Panoga	02 model-200 m^3	32.77364	75.94194	2299
333	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Pedi Nalla	Chakoli	Kihar	Bhadroh	02 model-200 m^3 03 model-90 m^3	32.72123	76.06194	1524
334	RV/HP/CI/02	Himachal	Chamba	Churah	Pedi Nalla	Chakoli	Kihar	Bhadroh	02 model-220 m^3	32.72406	76.05165	1631

		Pradesh										
335	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Suil Ghar / Land Slide	Chakoli	Kihar	Kihar	02 model-210 m^3	32.48771	75.94095	1050
336	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Sukolie Nalla	Chakoli	Panoga	Bhaint	02 model-200 m^3	32.83497	75.89008	1939
337	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Fatdi Nalla	Chakoli	Panoga	Jamla	02 model-320 m^3	32.80047	75.90356	2133
338	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Sadruni Ghar	Himgiri	Khangu	Chilli	02 model-250 m^3 03 model-90 m^3	32.82506	76.10362	4703Ft.
339	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Sagti Nalla	Tissa	Sei	Sagti	02 model-220 m^3	32.85148	76.08515	2204
340	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Sahu Nalla	Himgiri	Khangu	Ail	02 model-300 m^3	32.84556	76.01537	6670ft.
341	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Saini Nalla	Himgiri	Himgiri	Billa	02 model-210 m^3	32.79347	76.05419	2207
342	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Sarian (Nry) New Raised Nursery	Bhalei	Bhunad	Smah	02 model-220 m^3 03 model-100 m^3	32.62845	75.95822	1450
343	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Sarwani Nalla	Himgiri	khangu	Ail	02 model-210 m^3	32.8426	76.04293	1652
344	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Satnal Nalla	Tissa	Baira	Baira	02 model-300 m^3	32.89715	76.17266	1941
345	RV/HP/CI/02	Himachal	Chamba	Churah	Satnala	Tissa	Tissa	Devikothi	02 model-220 m^3	32.91793	76.21812	2554

		Pradesh			Nalla							
346	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Satrundi Nalla	Tissa	Baira	Baira	02 model-300 m^3	32.88382	76.15619	1651
347	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Churah	Satrundi	Tissa	Baira	Baira	01 model-160 m^3 02model-300 m^3 04 model-560 m^3	32.89976	76.14969	1581
348	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Dibhari Nalla	Chakoli	Panoga	Talai	02 model-200 m^3	32.74144	75.95056	2562
349	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Dibhari Nalla	Chakoli	Panoga	Talai	02 model-220 m^3	32.74144	75.95056	2562
350	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Chamdeu Nalla	Chakoli	Salooni	Kilod	02 model-210 m^3	32.74047	75.95728	2444
351	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Chamdeu Nalla	Chakoli	Salooni	Kilod	02 model-450 m^3	32.74047	75.95728	2444
352	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Jakral Nalla	Chakoli	Panoga	Talai Beat	02 model-220 m^3	32.75614	75.95342	2119
353	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Jakral Nalla	Chakoli	Panoga	Talai Beat	02 model-290 m^3	32.75614	75.95342	2119
354	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Ranka Nalla	Chakoli	Panoga	Talai	02 model-200 m^3	32.75614	75.92678	2657
355	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Tribhol Nalla	Chakoli	Salooni	Kilod	02 model-114 m^3	32.752	75.97253	1848
356	RV/HP/CI/02	Himachal	Chamba	Churah	Tribhol	Chakoli	Salooni	Kilod	02 model-230 m^3	32.752	75.97253	1848

		Pradesh			Nalla							
357	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Seru Ghar	Himgiri	Himgiri	Billa	02 model-220 m^3	32.78411	76.06102	3432
358	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Shaddar Nalla	Tissa	Sei	Jangbani	02 model-220 m^3	32.86596	76.03219	2148
359	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Shagla Ghar	Himgiri	Himgiri	Himgiri	02 model-240 m^3	32.78269	76.09678	6497ft
360	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Shagwadi Nalla	Himgiri	khangu	Kherna	02 model-220 m^3	32.82668	76.06635	1475
361	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Shalla Nalla	Bhalei	Bhunad	Bhunad	02 model-230 m^3	32.67323	75.90378	1233
362	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Shishal Nursey	Chakoli	Salooni	Salooni	02 model-200 m^3	32.72101	76.05348	1300
363	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Singra Nalla	Tissa	Baira	Mansa	02 model-200 m^3	32.94759	76.1593	2198
364	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Sinol Ghar	Tissa	Tissa	Devikothi	02 model-210 m^3	32.89986	76.22441	2021
365	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Siyarehi Nalla	Himgiri	Himgiri	Billa	02 model-200 m^3	32.78996	76.04706	2089
366	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Sukralli Nalla	Tissa	Tissa	Tissa	02 model-200 m^3	32.86968	76.16386	2172
367	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Tain Nalla	Tissa	Tissa	Chandru	02 model-200 m^3	32.90618	76.28013	2805

368	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Tanina Nalla	Bhalei	Bhalei	Wangal	02 model-299 m^3	32.64056	76.16056	1207
369	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Tappar Nalla	Bhalei	Bhunad	Bhunad	02 model-200 m^3 03 model-80 m^3	32.6952	75.91126	1497
370	RV/HP/CI/01,02,03 & 05	Himachal Pradesh	Chamba	Churah	Tappar Nalla	Bhalei	Bhunad	Bhunad	01 model-140 m^3 02model-200 m^3 03 model-300 m^3 05 model-110 m^3	32.6952	75.91126	1497
371	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Tarira Ghar	Himgiri	khangu	chundi	02 model-350 m^3 03 model-100 m^3	32.58969	76.02722	1242
372	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Tepa Nalla	Tissa	Tissa	Devikothi	02 model-280 m^3	32.93095	76.23646	2519
373	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Tharo Ghar	Tissa	Sei	Jangbani	02 model-240 m^3	32.85392	76.0245	1961
374	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Thatti ghara	Tissa	Tissa	Pugthala	02 model-200 m^3 03 model-200 m^3	32.85557	76.16681	2321
375	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Tikker Gadlei Nalla	Bhalei	Bhalei	Bhing	02 model-200 m^3	32.65576	75.97215	1601
376	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Tilnati Nalla	Himgiri	Himgiri	Billa	02 model-310 m^3	32.8212	76.13703	
377	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Churah	Tuhin Nalla	Bhalei	Sundla	Sundla	02 model-200 m^3 03 model-50 m^3	32.67498	76.03687	829
378	RV/HP/CI/02	Himachal	Chamba	Churah	Tukred Nalla	Chakoli	Salooni	Manjeer	02 model-350 m^3	32.71572	76.06361	1297

		Pradesh										
379	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Churah	Tullu Goth	Tissa	Sei	Jangbani	01 model-160 m^3 02model-300 m^3 04 model-600 m^3	32.87267	76.04446	2610
380	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Twari Nalla (Athad Nalla)	Bhalei	Sundla	Salwan	02 model-210 m^3	32.70424	75.97276	1508
381	RV/HP/CI/02	Himachal Pradesh	Chamba	Churah	Upper Tain Nalla	Tissa	Tissa	Chandru	02 model-200 m^3	32.89167	76.27083	2440
382	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Churah	Gallu	Tissa	Baira	Shoul	01 model-190 m^3 02model-200 m^3 04 model-590 m^3	32.90304	76.12799	2600
383	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Churah	Nakata	Tissa	Baira	Shoul	01 model-190 m^3 02model-200 m^3 04 model-600 m^3	32.92572	76.11074	2991
384	RV/HP/CI/01,02 & 04	Himachal Pradesh	Chamba	Churah	Dibhari	Bhalei	Sundla	Salwan	01 model-170 m^3 02model-200 m^3 04 model-600 m^3	32.73631	75.952	2616
385	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Balera (Including Nallas of Kundan No. 1 DPF, Kudan No. 2 DPF, K	Bakloh	Mamul	Balera	02 model-100 m^3	32.51601	75.96918	1745
386	RV/HP/CI/02	Himachal	Chamba	Dalhousie	Bedal (including	Bakloh	Mail	Mail	02 model-684 m^3	32.49753	75.90847	945

		Pradesh			Nallas of Bedal No 1 DPF, Bedal No 2 DPF, Bedal No 3 DPF,Tandal DPF)							
387	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Dalhousie	Chahla Nalla	Dalhousie	Drada	Drada	02 model-470 m^3 03 model-500 m^3	32.58603	76.0392	1473
388	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Dalhousie	Channa Nalla	Dalhousie	Drada	Drada	02 model-367 m^3 03 model-800 m^3	32.59289	75.99561	1112
389	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Chehli Nalla	Dalhousie	Chaned	Bhanota	02 model-816 m^3	32.58937	76.04579	1513
390	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Dalhousie	Chouda Nalla	Dalhousie	Surkhigalla	Sherpur	02 model-550 m^3 03 model-300 m^3	32.5978	75.98089	672
391	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Dadri Nalla	Dalhousie	Chaned	Bhanota	02 model-650 m^3	32.59642	76.06268	1134
392	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Dagoh (including Nallas of Dagoh DPF, Rouni No. 2 DPF, Tunuhatti DPF)	Bakloh	Nainikhad	Tunuhatti	02 model-730 m^3	32.48826	75.89704	795
393	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Darua nalla	Dalhousie (Surkhigalla)	Chaned	Udaipur	02 model-632 m^3	32.57998	76.09918	

394	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Dharmari Nalla	Dalhousie	Chaned	Bhanota	02 model-600 m^3	32.60092	76.04614	1276
395	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Dalhousie	Drada Nalla	Dalhousie	Drada	Drada	02 model-370 m^3 03 model-500 m^3	32.58374	76.01941	1320
396	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Droda Nalla	Dalhousie (Surkhiga la)	Chaned	Singi	02 model-735 m^3	32.57008	76.0676	1395
397	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Golli	Dalhousie	Drada	Golli	02 model-720 m^3	32.56834	75.98553	
398	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Kandei (including Nallas of Buhana Mo 1 DPF,Bhuana No 2 DPF, Manderaqn DPF)	Bakloh	Mail	kandei	02 model-570 m^3	32.57499	75.90227	1080
399	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Kapei (including Nallas of Kapei UPF, Mihanu UPF, Mihanu DPF, Samleu no 2 DPF)	Bakloh	Mail	kandei	02 model-663 m^3	32.57784	75.89121	750
400	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Katori (including	Bakloh	Nainikhad	Katori	02 model-735 m^3	32.48365	75.90848	

					Nallas of Katori DPF, Chalela No 1 DPF, Chaela No 2 DPF, Chamber DPF)							
401	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	katori (including Nallas of Katori DPF, Chalela No 1 DPF, Chaela No 2 DPF, Chamber DPF)	Bakloh	Nainikhad	Katori	02 model-690 m^3	32.48592	75.91028	
402	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Khabbar Nalla	Dalhousie	Chaned	Bhanota	02 model-590 m^3	32.59601	76.04003	1399
403	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Dalhousie	Lahar No.2 DPF	Dalhousie	Surkhigalla	Megzeen	02 model-210 m^3 03 model-640 m^3	32.5181	75.93854	1360
404	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Mail (Including Nallas of Tandal DPF, Draman No1 DPF, Chamb No 1 DPF, Sindhigarh DPF)	Bakloh	Mail	Mail	02 model-815 m^3	32.50993	75.90245	820

405	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Nadu di Nalli	Dalhousie (Surkhigalla)	Chaned	Udaipur	02 model-720 m^3	32.57429	76.10458	1144
406	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Dalhousie	Nagali	Dalhousie	Sukdaih	Nagali	02 model-501 m^3 03 model-252 m^3	32.56928	75.91761	1204
407	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Dalhousie	Naghuni Nalla	Dalhousie	Drada	Drada	02 model-490 m^3 03 model-490 m^3	32.58897	76.00769	1350
408	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Dalhousie	Nature park at Banikhet	Dalhousie	Surkhigala	Banikhet	02 model-300 m^3 03 model-300 m^3	32.5417	76.131	857
409	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Samana Nalli	Dalhousie(Surkhigalla)	Chaned	Udaipur	02 model-670 m^3	32.57456	76.10021	1210
410	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Sandhara (including Nallas of Kut No 1 DPF, Kut No 2 DPF, Lahri DPF, Chambi DPF,Sudli DPF)	Bakloh	Mail	Sandhaa	02 model-535 m^3	32.54539	75.89458	1075
411	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Dalhousie	Singi Nalla	Dalhousie(Surkhigal)	Chaned	Singi	02 model-600 m^3 03 model-130 m^3	32.5775	76.06733	1354
412	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Sukreni Nalla	Dalhousie(Surkhigalla)	Chaned	Singi	02 model-675 m^3	32.57992	76.08643	907
413	RV/HP/CI/02 & 03	Himachal	Chamba	Dalhousie	Surkhigala Beat -	Surkhigala	Surkhigala	Surkhigala	02 model-350 m^3 03	32.6175	76.095	1412

		Pradesh			Tarptka Nalla				model-250 m^3			
414	RV/HP/CI/02 & 03	Himachal Pradesh	Chamba	Dalhousie	Tapper Chouda Nalla	Dalhousie	Surkhigalla	Sherpur	02 model-570 m^3 03 model-120 m^3	32.57	75.95889	744
415	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Tunuhatti (including Nallas of Hatli DPF, Chalana DPF, Tunuhatti DPF,Rouni 1&2 DPF)	Bakloh	Nainikhad	Tunuhati	02 model-800 m^3	32.49306	75.91174	911
416	RV/HP/CI/02	Himachal Pradesh	Chamba	Dalhousie	Udaipur-Rinda Nalla	Dalhousie (Surkhigalla)	Chaned	Udaipur	02 model-670 m^3	32.57032	76.07423	1540

Annexure 29: The Geo Co-ordinates and model name of Proposed Forestry Intervention Sites in Soil and Moisture Conservation of Ravi Riverscape in Jammu & Kashmir UT

Sr No.	Model	State	District	Division	Sitename	Range	Block	Beat	Area (m^3)	Lat1	Long1	Ele1
1	RV/JK/CI/02 & 03	Jammu & Kashmir	Kathua	Basohli	Madla comp 22/Bsl	Basohli	Basohli	Basohli	02 model-200 m^3 03 model- 250m^3	32.51466	75.82779	
2	RV/JK/CI/ 03	Jammu & Kashmir	Kathua	Billawar	Makwal	Ramkot	Rajwalta	Kaudharno	03 model- 280m^3	32.61269	75.33215	715
3	RV/JK/CI/02 & 03	Jammu & Kashmir	Kathua	Billawar	Salore	Ramkot	Rajwalta	Kandharno and	02 model-350 m^3 03 model- 550m^3	32.47011	75.39669	

								Rajwatta				
4	RV/JK/CI/02 & 03	Jammu & Kashmir	Kathua	Billawar	Shuara, Co 16 b/RKT, Lakhri Beat	Ramkot	Garh	Lakhri	02 model-200 m^3 03 model- 300m^3	32.66824	75.42026	
5	RV/JK/CI/02 & 03	Jammu & Kashmir	Kathua	Billawar	Tardal, Rajwalta beat, Co. No. 10/RKT	Ramkot	Rajwalta	Kandharno and Rajwatta	02 model-200 m^3 03 model- 300m^3	32.55276	75.39305	554
6	RV/JK/CI/03	Jammu & Kashmir	Kathua	Kathua	Amb Nalla Nund co-16/J	Jasrota	Rajwalta	Galak	03 model- 300m^3	32.61268	75.34219	
7	RV/JK/CI/02 & 03	Jammu & Kashmir	Kathua	Kathua	Bandi Nall, co- 74/J	Jasrota	Lower Hiranagar	Said kootha	02 model-500 m^3 03 model- 250m^3	32.52462	75.25306	
8	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Co- 29 k, Mekedi Naal	Kathua	Budhi	sundrikot	02 model- 450m^3	32.83757	75.56132	
9	RV/JK/CI/02 & 03	Jammu & Kashmir	Kathua	Kathua	Co- 30k, Baba Naal	Kathua	Budhi	sundrikot	02 model-470 m^3 03 model- 560m^3	32.50465	75.48997	
10	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Co- 32k, Nami Naal, Kui Naal, Shera Naal	Kathua	Budhi	Juthara	02 model- 500m^3	32.50379	75.48739	
11	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Co- 4k, Sari Naal	Kathua	Budhi	Barwal	02 model- 450m^3	32.43248	75.50847	
12	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Co-21K, Kanara	Kathua	Basantpur	Tangdi Gali	02 model- 300m^3	32.45254	75.66121	
13	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Co-21k, Kanara	Kathua	Basantpur	Tangdi Gali	02 model- 350m^3	32.46657	75.66769	
14	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Co-25 K (Malorh)	Kathua	Janslote	Dilwan Dhole	02 model- 350m^3	32.46384	75.57001	

15	RV/JK/CI/02 & 03	Jammu & Kashmir	Kathua	Kathua	Co-27/K Saida Naal (Janglote Beat)	Kathua	Janglote	Janglote Beat 1st	02 model-360 m^3 03 model- 840m^3	32.42835	75.52195	
16	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Co-28/ K Arni Nal	Kathua	Budhi	Sundrikot	02 model- 480m^3	32.49477	75.54969	
17	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Co-2k , 3k, southal naal, Bindal naal, Bicho Naal	Kathua	Budhi	Budli	02 model- 480m^3	32.46372	75.47784	
18	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Co-32 k, Kui naal, Chur naal	Kathua	Budhi	Jothara	02 model- 300m^3	32.50372	75.47843	
19	RV/JK/CI/02 & 03	Jammu & Kashmir	Kathua	Kathua	Co-33/J Dasanu village (Tarnah Nalla)	Jasrota	Rajwalta	Thein	02 model-200 m^3 03 model- 300m^3	32.56017	75.37703	
20	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Co/25K Patyari Naal	Kathua	Janglote	Janglote Beat 2nd	02 model- 300m^3	32.44392	75.57094	
21	RV/JK/CI/02 & 03	Jammu & Kashmir	Kathua	Kathua	Gara, co-73/J	Jassota	Lower Hiranagar	Said kootha	02 model-100 m^3 03 model- 300m^3	32.47944	75.26466	361
22	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Jodha Nall co-	Kathua	Budhi	Jothara	02 model- 450m^3	32.49945	75.48021	
23	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Jolla Nol co-31 k	Kathua	kathua	Budli	02 model- 450m^3	32.49211	75.48043	
24	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Koda Bada co-77/J	Jasrota	Lower Hiranagar	Said kootha	02 model- 200m^3	32.53229	75.30439	
25	RV/JK/CI/02 & 03	Jammu & Kashmir	Kathua	Kathua	Malni nalla Bera-1 83 J	Jassota	Mastgarh	Bera-1	02 model-150 m^3 03 model- 300m^3	32.51631	75.40786	
26	RV/JK/CI/ 03	Jammu &	Kathua	Kathua	Malni Nalla	Jasrota	Mastgarh	Bera-1	03 model- 300m^3	32.51056	75.40806	

		Kashmir			Bera-1, 83 J							
27	RV/JK/CI/02 & 03	Jammu & Kashmir	Kathua	Kathua	Mayan Co-75/J	Jasrota	Lower Hiranagar	Said kootha	02 model-200 m^3 03 model- 250m^3	32.57444	75.52222	
28	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Messa Nal. Co 4k	Kathua	Budhi	Baswol	02 model- 450m^3	32.47096	75.51243	
29	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Pari Nal, Merida Nall, ManjaNo.l	Kathua	Budhi	Jothara	02 model- 450m^3	32.50011	75.48583	
30	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Plail Naal, Kronda Naal, Co- 31 k	Kathua	Budhi	Thatti	02 model- 450m^3	32.49674	75.4961	
31	RV/JK/CI/02 & 03	Jammu & Kashmir	Kathua	Kathua	Sait Nallah	Jasrota	Mastgarh	Khtair	02 model-200 m^3 03 model- 300m^3	32.55128	75.40022	
32	RV/JK/CI/03	Jammu & Kashmir	Kathua	Kathua	Sait Nallah 49 J,Khair Beat	Jasrota	Mastgarh	Khtair co-49 J	03 model- 300m^3	32.55113	75.40272	
33	RV/JK/CI/02 & 03	Jammu & Kashmir	Kathua	Kathua	Sohal saida co- 76/J	Jassota	Lower Hiranagar	Said kootha	02 model-200 m^3 03 model- 300m^3	32.53682	75.28325	
34	RV/JK/CI/03	Jammu & Kashmir	Kathua	Kathua	Tanthode-Bein, co-33/J	Jasrota	Rajwalta	Thein	03 model- 300m^3	32.56878	75.3568	
35	RV/JK/CI/02 & 03	Jammu & Kashmir	Kathua	Kathua	Ujh, Thalla Nallah, Co-26J	Jasrota	Mast Garh	Mast Garh	02 model-200 m^3 03 model- 300m^3	32.55806	75.49194	
36	RV/JK/CI/02	Jammu & Kashmir	Kathua	Kathua	Ujh, Thalla Nallah, Co-26J Mastgarh	Jasrota Hiranagar	Mastgarh	Mastgarh	02 model- 350m^3	32.55806	75.49363	
37	RV/JK/CI/02 & 03	Jammu & Kashmir	Samba	Samba	Co. 34/D & 35/D Mohargarh	Mohargarh	Mohargarh	Mohargarh	02 model-200 m^3 03 model- 300m^3	32.54336	75.38512	379

38	RV/JK/CI/03	Jammu & Kashmir	Samba	Samba	Co. 66/J, Rattanpur Khad	Samba	Ghagwal	Surara	03 model- 300m^3	32.54885	75.12534	
39	RV/JK/CI/03	Jammu & Kashmir	Samba	Samba	Co. 67/B & 69/B Chanoori Khad	Samba	Goran	Jar Jarily	03 model- 300m^3	32.54898	75.12366	
40	RV/JK/CI/03	Jammu & Kashmir	Samba	Samba	Comptt. No. 54/B, 40/B, 41/B, 30/B & 31/B	Mohargarh	Soram	Samotha	03 model- 300m^3	32.56479	75.20192	643
41	RV/JK/CI/03	Jammu & Kashmir	Samba	Samba	Forest Nursery B alode	Samba	Nud	Kali	03 model- 250m^3	32.54369	75.14073	410
42	RV/JK/CI/03	Jammu & Kashmir	Samba	Samba	Mandal (Bada Khetar)	Purmandal	Purmandal	Mandal	03 model- 250m^3	32.52115	75.11373	347
43	RV/JK/CI/02 & 03	Jammu & Kashmir	Udhampur	Billawar	FagwaraPani Co. No. 27/Rkt, Beat Kamdala-I	Ramkot	Kamdala	Kamdala-I	02 model-300 m^3 03 model- 500m^3	32.64381	75.39098	

Annexure 30: The Geo Co-ordinates and model name of Proposed Forestry Intervention Sites in Soil and Moisture Conservation of Ravi Riverscape in Punjab

Sr No.	Model	State	District	Division	Sitename	Range	Area (m^3)	Lat1	Long1
1	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Abadai Harnam Singh	Ajnala	01 model-160 m^3 02 model- 300 m^3 04 model- 1500 m^3	31.9104	74.7219
2	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Abadi Baba Gumchuck	Ajnala	01 model-160 m^3 02 model- 300 m^3 04 model- 900 m^3	31.8946	74.7293

3	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Bal labe draya	Ajnala	01 model-150 m^3 02 model- 300 m^3 04 model- 900 m^3	31.9294	74.7665
4	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Balharwal	Ajnala	01 model-180 m^3 02 model- 300 m^3 04 model- 800 m^3	31.9066	74.7137
5	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Barlass	Ajnala	01 model-140 m^3 02 model- 300 m^3 04 model- 800 m^3	31.8645	74.6534
6	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Bazwa	Ajnala	01 model-190 m^3 02 model- 300 m^3 04 model- 740 m^3	31.9328	74.835
7	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Bedi Channa	Ajnala	01 model-180 m^3 02 model- 300 m^3 04 model- 800 m^3	31.9499	74.8125
8	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Bhagwanpur	Ajnala	01 model-190 m^3 02 model- 300 m^3 04 model- 740 m^3	31.9717	74.874
9	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Chann Sarangdev	Ajnala	01 model-170 m^3 02 model- 300 m^3 04 model- 800 m^3	31.8891	74.7043
10	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Chartewali	Ajnala	01 model-160 m^3 02 model- 300 m^3 04 model- 740 m^3	31.8929	74.72465
11	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Dalla Rajputtan	Ajnala	01 model-160 m^3 02 model- 300 m^3 04 model- 760 m^3	31.9022	74.7264
12	RV/PB/CI/01, 02	Punjab	Amritsar	Amritsar	Dariya mussa	Ajnala	01 model-160 m^3 02 model- 300 m^3	31.9717	74.837

	& 04						04 model- 760 m^3		
13	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Dhangai	Ajnala	01 model-190 m^3 02 model- 300 m^3 04 model- 800 m^3	31.964	74.8567
14	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Gaggar	Ajnala	01 model-180 m^3 02 model- 300 m^3 04 model- 760 m^3	31.9951	74.8604
15	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Gaggo mahal	Ajnala	01 model-180 m^3 02 model- 300 m^3 04 model- 760 m^3	31.909	74.8047
16	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Ghonewala	Ajanala	01 model-110 m^3 02 model- 300 m^3 04 model- 800 m^3	32.0151	74.9235
17	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Ghumrrai	Ajnala	01 model-180 m^3 02 model- 300 m^3 04 model- 750 m^3	31.9894	74.851
18	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Grantch Garh	Ajnala	01 model-160 m^3 02 model- 300 m^3 04 model- 740 m^3	31.8859	74.7124
19	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Hashampura	Ajnala	01 model-180 m^3 02 model- 300 m^3 04 model- 780 m^3	31.8686	74.6542
20	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Jafar Kot	Ajnala	01 model-180 m^3 02 model- 300 m^3 04 model- 800 m^3	31.8767	74.6808
21	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Jagdev Khurd	Ajnala	01 model-150 m^3 02 model- 300 m^3 04 model- 790 m^3	31.9041	74.7502

22	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Jatta	Ajnala	01 model-150 m^3 02 model- 300 m^3 04 model- 780 m^3	31.996	74.9014
23	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Kallomahal	Ajnala	01 model-150 m^3 02 model- 300 m^3 04 model- 760 m^3	31.924	74.8279
24	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Katle	Ajnala	01 model-140 m^3 02 model- 300 m^3 04 model- 800 m^3	31.9686	74.873
25	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Khanwal	Ajnala	01 model-150 m^3 02 model- 300 m^3 04 model- 790 m^3	31.8992	74.6961
26	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Koti Shah Habib	Ajnala	01 model-190 m^3 02 model- 300 m^3 04 model- 800 m^3	31.9729	74.8938
27	RV/PB/CI/01, 02, 03 & 04	Punjab	Amritsar	Amritsar	Kotli Koka	Ajnala	01 model-190 m^3 02 model- 200 m^3 03 model- 100 m^3 04 model- 800 m^3	31.8928	74.6867
28	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Machiwala	Ajnala	01 model-260 m^3 02 model- 180 m^3 04 model- 800 m^3	32.0116	74.9285
29	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Mahmad Mandranwala	Ajnala	01 model-150 m^3 02 model- 300 m^3 04 model- 790 m^3	31.983	74.8834
30	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Nagal Sohal	Ajnala	01 model-130 m^3 02 model- 300 m^3 04 model- 800 m^3	31.89247	74.71603
31	RV/PB/CI/01, 02	Punjab	Amritsar	Amritsar	Nangal Amb	Ajnala	01 model-150 m^3	31.9186	74.7723

	& 04						02 model- 300 m^3 04 model- 790 m^3		
32	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Nawan Dalla Rajputtan	Ajnala	01 model-140 m^3 02 model- 300 m^3 04 model- 750 m^3	31.9023	74.7265
33	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Nissoke	Ajnala	01 model-130 m^3 02 model- 300 m^3 04 model- 760 m^3	32.006	74.8893
34	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Panj garaian wahla	Ajnala	01 model-130 m^3 02 model- 300 m^3 04 model- 760 m^3	32.0003	74.8482
35	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Pashia	Ajnala	01 model-150 m^3 02 model- 300 m^3 04 model- 730 m^3	31.89427	74.71351
36	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Poonga	Ajnala	01 model-150 m^3 02 model- 300 m^3 04 model- 800 m^3	31.8634	74.6788
37	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Raipur Kalan	Ajnala	01 model-130 m^3 02 model- 300 m^3 04 model- 760 m^3	31.8971	74.679
38	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Ramdass urban	Ajnala	01 model-130 m^3 02 model- 300 m^3 04 model- 740 m^3	31.973	74.912
39	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Rurewal	Ajnala	01 model-130 m^3 02 model- 300 m^3 04 model- 740 m^3	31.9743	74.8598
40	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Sahowal	Ajnala	01 model-150 m^3 02 model- 300 m^3 04 model- 800 m^3	31.9198	74.732

41	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Saidogazi	Ajnala	01 model-150 m^3 02 model- 300 m^3 04 model- 760 m^3	31.8903	74.6674
42	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Sammowal		01 model-140 m^3 02 model- 300 m^3 04 model- 800 m^3	31.9314	74.8133
43	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Samrai bhandhai	Ajnala	01 model-130 m^3 02 model- 300 m^3 04 model- 780 m^3	31.9314	74.8133
44	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Sarangdev	Ajnala	01 model-150 m^3 02 model- 300 m^3 04 model- 780 m^3	31.8805	74.6967
45	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Shahliwal	Ajnala	01 model-140 m^3 02 model- 300 m^3 04 model- 780 m^3	31.8802	74.6589
46	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Shaidpur Khurd	Ajnala	01 model-140 m^3 02 model- 300 m^3 04 model- 730 m^3	31.8657	74.667
47	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Shehzada	Ajnala	01 model-160 m^3 02 model- 300 m^3 04 model- 780 m^3	32.0056	74.8994
48	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Sheikh Bhatti	Ajnala	01 model-130 m^3 02 model- 300 m^3 04 model- 760 m^3	31.8785	74.6656
49	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Sheikh Bhatti Jantawali	Ajnala	01 model-150 m^3 02 model- 300 m^3 04 model- 780 m^3	31.8727	74.6672
50	RV/PB/CI/01, 02	Punjab	Amritsar	Amritsar	Singhoke	Ajnala	01 model-150 m^3 02 model- 300 m^3	32.0103	74.8773

	& 04						04 model- 790 m^3		
51	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Suffian	Ajnala	01 model-130 m^3 02 model- 300 m^3 04 model- 760 m^3	31.9222	74.801
52	RV/PB/CI/01, 02 & 04	Punjab	Amritsar	Amritsar	Thoba	Ajnala	01 model-150 m^3 02 model- 300 m^3 04 model- 8000 m^3	31.9386	74.8502
53	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Agwan	Aliwal	01 model-150 m^3 02 model- 300 m^3 04 model- 1100 m^3	32.04942	75.1445
54	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Ali Nangal	Aliwal	01 model-190 m^3 02 model- 300 m^3 04 model- 1500 m^3	32.02807	75.01814
55	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Bariar	Gurdaspur	01 model-150 m^3 02 model- 300 m^3 04 model- 780 m^3	32.10111	75.30772
56	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Barlar		01 model-160 m^3 02 model- 300 m^3 04 model- 800 m^3	32.11209	75.30369
57	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Baupur Jattan	Gurdapur	01 model-130 m^3 02 model- 300 m^3 04 model- 900 m^3	32.13768	75.34961
58	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Behlopur	Aliwal	01 model-160 m^3 02 model- 300 m^3 04 model- 800 m^3	32.02965	75.03559
59	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Behrampur	Gurdaspur	01 model-190 m^3 02 model- 300 m^3 04 model- 780 m^3	32.10466	75.30568

60	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Bhagtana Tullian	Aliwal	01 model-140 m^3 02 model- 300 m^3 04 model- 800 m^3	32.0576	75.08793
61	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Bhathra Bheranalla	Aliwal	01 model-160 m^3 02 model- 300 m^3 04 model- 720 m^3	32.04841	75.05105
62	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Bhatia		01 model-190 m^3 02 model- 300 m^3 04 model- 750 m^3	32.1245	75.35912
63	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Bhukra	Gurdaspur	01 model-190 m^3 02 model- 300 m^3 04 model- 700 m^3	32.10542	75.29884
64	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Chakraja	Gurdaspur	01 model-150 m^3 02 model- 300 m^3 04 model- 780 m^3	32.12568	75.32665
65	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Chauntra, Dinanagar	Gurdaspur	01 model-140 m^3 02 model- 300 m^3 04 model- 760 m^3	32.1362	75.2858
66	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Chautra	Gurdaspur	01 model-160 m^3 02 model- 300 m^3 04 model- 800 m^3	32.13626	75.29149
67	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Chitti	Gurdaspur	01 model-180 m^3 02 model- 300 m^3 04 model- 800 m^3	32.14571	75.35238
68	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Chora-Bajwa	Aliwal	01 model-190 m^3 02 model- 300 m^3 04 model- 780 m^3	32.03384	75.02526
69	RV/PB/CI/01, 02	Punjab	Gurdaspur	Gurdaspur	Dakhla	Aliwal	01 model-160 m^3 02 model- 300 m^3	32.13396	75.37499

	& 04						04 model- 740 m^3		
70	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Davgabad	Aliwal	01 model-190 m^3 02 model- 300 m^3 04 model- 780 m^3	32.03422	75.02539
71	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Dharowal	Aliwal	01 model-160 m^3 02 model- 300 m^3 04 model- 790 m^3	32.03894	75.02887
72	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Dher	Aliwal	01 model-190 m^3 02 model- 300 m^3 04 model- 750 m^3	32.03052	75.02047
73	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Dhilwa		01 model-180 m^3 02 model- 300 m^3 04 model- 780 m^3	32.02836	75.03711
74	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Dorangla	Gurdaspur	01 model-180 m^3 02 model- 300 m^3 04 model- 800 m^3	32.10809	75.30166
75	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Dostpur	Gurdaspur	01 model-170 m^3 02 model- 300 m^3 04 model- 750 m^3	32.06889	75.21222
76	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Doulowal	Aliwal	01 model-180 m^3 02 model- 300 m^3 04 model- 790 m^3	32.02511	75.03345
77	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Faridpur	Gurdaspur	01 model-180 m^3 02 model- 300 m^3 04 model- 750 m^3	32.14888	75.34688
78	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	G.P Bhakot pur	Aliwal	01 model-210 m^3 02 model- 300 m^3 04 model- 800 m^3	32.11857	75.32399

79	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	G.P Bhaga Kawar		01 model-170 m^3 02 model- 300 m^3 04 model- 800 m^3	32.09708	75.30401
80	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	G.P Dhidowal		01 model-160 m^3 02 model- 300 m^3 04 model- 750 m^3	32.06333	75.13694
81	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	G.P Didowal	Aliwal	01 model-170 m^3 02 model- 300 m^3 04 model- 800 m^3	32.06333	75.13694
82	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	G.P Rosa	Aliwal	01 model-180 m^3 02 model- 300 m^3 04 model- 730 m^3	32.06167	75.12417
83	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	G.P Shuhar Kalan	Aliwal	01 model-160 m^3 02 model- 300 m^3 04 model- 800 m^3	32.04971	75.13671
84	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	G.P. Kothe Elahi Bakhash	Gurdaspur	01 model-210 m^3 02 model- 300 m^3 04 model- 780 m^3	32.14616	75.46642
85	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	G.P. Chandu wodala	Aliwal	01 model-180 m^3 02 model- 300 m^3 04 model- 780 m^3	32.07194	75.14611
86	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Gahlri	Gurdasp ur	01 model-180 m^3 02 model- 300 m^3 04 model- 760 m^3	32.12766	75.33578
87	RV/PB/CI/02 & 03	Punjab	Gurdaspur	Gurdaspur	Ghania Ke Bet	Gurdaspur	02 model- 200 m^3 03 model- 300 m^3	32.05469	74.92961
88	RV/PB/CI/01, 02	Punjab	Gurdaspur	Gurdaspur	Ghuman	Aliwal	01 model-160 m^3	32.03537	75.03898

	& 04						02 model- 400 m^3 04 model- 730 m^3		
89	RV/PB/CI/03	Punjab	Gurdaspur	Gurdaspur	Gola Dhola	Gurdaspur	03 model-300 m^3	32.0202	74.9852
90	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	GP Akhlaspur	Gurdaspur	01 model-190 m^3 02 model- 400 m^3 04 model- 790 m^3	32.11021	75.33145
91	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	GP Broye	Gurdaspur	01 model-180 m^3 02 model- 300 m^3 04 model- 760 m^3	32.10964	75.33253
92	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	GP Gaddian Kalan	Gurdaspur	01 model-180 m^3 02 model- 300 m^3 04 model- 800 m^3	32.07694	75.22667
93	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	GP Lehal	Gurdaspur	01 model-160 m^3 02 model- 300 m^3 04 model- 800 m^3	32.10776	75.32805
94	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	GP Singpura	Gurdaspur	01 model-180 m^3 02 model- 300 m^3 04 model- 800 m^3		
95	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	GP Theh	Gurdaspur	01 model-180 m^3 02 model- 300 m^3 04 model- 780 m^3	32.05407	75.1555
96	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	GP Trizanagar	Gurdaspur	01 model-260 m^3 02 model- 400 m^3 04 model- 1520 m^3	32.11516	75.3408
97	RV/PB/CI/03	Punjab	Gurdaspur	Gurdaspur	Gunnia	Gurdaspur	03 model-300 m^3	32.02645	75.03249
98	RV/PB/CI/02 & 04	Punjab	Gurdaspur	Gurdaspur	Gurchack	Gurdaspur	02 model- 200 m^3 04 model- 300 m^3	32.0192	74.9828

99	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Hawali kalan	Aliwal	01 model-160 m^3 02 model- 300 m^3 04 model- 780 m^3	32.03343	75.04837
100	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Islampur	Gurdaspur	01 model-180 m^3 02 model- 300 m^3 04 model- 800 m^3	32.12502	75.30484
101	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Jagatpur Kalam		01 model-160 m^3 02 model- 300 m^3 04 model- 800 m^3	32.10519	75.31927
102	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Jagatpur Khurnd		01 model-190 m^3 02 model- 300 m^3 04 model- 800 m^3	32.13283	75.37103
103	RV/PB/CI/02 & 03	Punjab	Gurdaspur	Gurdaspur	Jainpur, Dinanagar	Gurdaspur	02 model- 200 m^3 04 model- 300 m^3	32.1523	75.3398
104	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Kahna	Gurdaspur	01 model-600 m^3 02 model- 300 m^3 04 model- 740 m^3	32.15593	75.34449
105	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Kailey Kalan	Gurdaspur	01 model-140 m^3 02 model- 300 m^3 04 model- 750 m^3	32.11917	75.33706
106	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Khichian		01 model-670 m^3 02 model- 300 m^3 04 model- 800 m^3	32.11224	75.33795
107	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Khushipur	Gurdaspur	01 model-150 m^3 02 model- 300 m^3 04 model- 800 m^3	32.11647	75.3199
108	RV/PB/CI/03	Punjab	Gurdaspur	Gurdaspur	Lallowal	Gurdaspur	03 model-300 m^3	32.045	74.9413
109	RV/PB/CI/01, 02	Punjab	Gurdaspur	Gurdaspur	Lohara-wali	Aliwal	01 model-200 m^3	32.03428	75.02559

	& 04						02 model- 600 m^3 04 model- 1520 m^3		
110	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Mallian Faikhira	Gurdaspur	01 model-140 m^3 02 model- 300 m^3 04 model- 800 m^3	32.11652	75.32979
111	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Mangal Sain	Gurdaspur	01 model-140 m^3 02 model- 300 m^3 04 model- 800 m^3	32.058	75.194
112	RV/PB/CI/03	Punjab	Gurdaspur	Gurdaspur	Mansur	Gurdaspur	03 model-300 m^3	32.03388	74.93445
113	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Miani Malah	Gurdaspur	01 model-150 m^3 02 model-300 m^3 04 model- 780 m^3	32.14238	75.32074
114	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Mirjapur	Gurdaspur	01 model-140 m^3 02 model- 300 m^3 04 model- 800 m^3	32.14348	75.29632
115	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Mirkchan	Gurdaspur	01 model-130 m^3 02 model- 300 m^3 04 model- 780 m^3	32.04139	75.095
116	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Mumi Chak ranga, Dinanagar	Gurdaspur	01 model-280 m^3 02 model- 300 m^3 04 model- 790 m^3	32.1894	75.3252
117	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Naushehra	Gurdaspur	01 model-130 m^3 02 model- 300 m^3 04 model- 800 m^3	32.12675	75.32172
118	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Pabarali khard	Aliwal	01 model-220 m^3 02 model- 400 m^3 04 model- 1600 m^3	32.03387	75.0384
119	RV/PB/CI/01, 02	Punjab	Gurdaspur	Gurdaspur	Padda	Aliwal	01 model-140 m^3	32.0383	75.0371

	& 04						02 model- 300 m^3 04 model- 730 m^3		
120	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Pakiwa	Aliwal	01 model-150 m^3 02 model- 300 m^3 04 model- 780 m^3	32.05833	75.12528
121	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	urdaspur	Patli Talwandi Hinduan	Aliwal	01 model-210 m^3 02 model- 600 m^3 04 model- 1520 m^3	32.04899	75.12998
122	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Patti Talwandi Rana		01 model-300 m^3 02 model- 600 m^3 04 model- 1580 m^3	32.03491	75.02897
123	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Patti Wraich	Aliwal	01 model-690 m^3 02 model- 300 m^3 04 model- 780 m^3	32.03563	75.03448
124	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Phabarari	Aliwal	01 model-360 m^3 02 model- 600 m^3 04 model- 1500 m^3	32.0312	75.0309
125	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Purana Challa		01 model-350 m^3 02 model- 100 m^3 04 model- 800 m^3	32.05329	74.94778
126	RV/PB/CI/03	Punjab	Gurdaspur	Gurdaspur	Purana wala	Gurdasp ur	03 model-300 m^3	32.05329	74.94778
127	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Raimal	Aliwal	01 model-120 m^3 02 model- 300 m^3 04 model- 800 m^3	32.03515	75.02528
128	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Ranmal	Aliwal	01 model-200 m^3 02 model- 400 m^3 04 model- 1520 m^3	32.03017	75.03613
129	RV/PB/CI/01, 02	Punjab	Gurdaspur	Gurdaspur	Ransiko Talla	Aliwal	01 model-300 m^3	32.03541	75.03003

	& 04						02 model- 600 m^3 04 model- 1800 m^3		
130	RV/PB/CI/01, 02 & 04	Punjab	Gurdaspur	Gurdaspur	Raowal	Aliwal	01 model-120 m^3 02 model- 300 m^3 04 model- 900 m^3	32.03901	75.02769
131	RV/PB/CI/03	Punjab	Gurdaspur	Gurdaspur	Rasulpur	Gurdaspur	03 model-300 m^3	32.04454	74.9288
132	RV/PB/CI/02 & 03	Punjab	Gurdaspur	Gurdaspur	Salach, Dinanagar	Gurdaspur	02 model- 200 m^3 03 model- 300 m^3	32.14522	75.47413
133	RV/PB/CI/02 & 03	Punjab	Gurdaspur	Gurdaspur	Salach, Dinanagar	Gurdaspur	02 model- 200 m^3 03 model- 100 m^3	32.1437	75.2902
134	RV/PB/CI/02 & 03	Punjab	Gurdaspur	Gurdaspur	Sangor	Gurdaspur	01 model-140 m^3 02 model- 300 m^3 04 model- 800 m^3	32.12601	75.31758
135	RV/PB/CI/01,02 & 04	Punjab	Gurdaspur	Gurdaspur	Santuwal	Aliwal	01 model-130 m^3 02 model- 300 m^3 04 model- 780 m^3	32.0294	75.03501
136	RV/PB/CI/01,02 & 04	Punjab	Gurdaspur	Gurdaspur	Shikar	Aliwal	01 model-140 m^3 02 model- 300 m^3 04 model- 800 m^3	32.03524	75.03871
137	RV/PB/CI/01,02 & 04	Punjab	Gurdaspur	Gurdaspur	Shri Rampur	Gurdaspur	01 model-140 m^3 02 model- 300 m^3 04 model- 800 m^3	32.15189	75.33026
138	RV/PB/CI/01,02 & 04	Punjab	Gurdaspur	Gurdaspur	Sultani	Gurdaspur	01 model-140 m^3 02 model- 300 m^3 04 model- 750 m^3	32.12868	75.36207
139	RV/PB/CI/01,02 & 04	Punjab	Gurdaspur	Gurdaspur	Tajpur	Gurdaspur	01 model-130 m^3 02 model- 300 m^3 04 model- 800 m^3	32.11362	75.31042
140	RV/PB/CI/01,02 &	Punjab	Gurdaspur	Gurdaspur	Thathi	Gurdaspur	01 model-150 m^3	32.14836	75.34143

	04						02 model- 300 m^3 04 model- 720 m^3		
141	RV/PB/CI/01,02 & 04	Punjab	Gurdaspur	Gurdaspur	Thundi	Gurdaspur	01 model-150 m^3 02 model- 300 m^3 04 model- 800 m^3	32.12221	75.30678
142	RV/PB/CI/01,02 & 04	Punjab	Gurdaspur	Gurdaspur	Udhowali kalan	Aliwal	01 model-2000 m^3 02 model- 300 m^3 04 model- 750 m^3	32.03298	75.03236
143	RV/PB/CI/01,02 & 04	Punjab	Gurdaspur	Gurdaspur	Udhowali khad	Aliwal	01 model-150 m^3 02 model- 300 m^3 04 model- 800 m^3	32.0346	75.02776
144	RV/PB/CI/01,02 & 04	Punjab	Gurdaspur	Gurdaspur	Ugra	Gurdaspur	01 model-150 m^3 02 model- 300 m^3 04 model- 800 m^3	32.15889	75.35189
145	RV/PB/CI/01,02 & 04	Punjab	Gurdaspur	Gurdaspur	Wazirpur Afgana	Gurdaspur	01 model-150 m^3 02 model- 300 m^3 04 model- 800 m^3	32.1266	75.30451
146	RV/PB/CI/01,02 & 04	Punjab	Pathankot	Pathankot	P5 - Dalla Forrest	Dhar	01 model-150 m^3 02 model- 300 m^3 04 model- 780 m^3	32.41388	75.79201
147	RV/PB/CI/02 & 04	Punjab	Pathankot	Pathankot	UP & Sec-4 Matti	Dhar	02 model- 350 m^3 04model- 300 m^3	32.39232	75.73758

Annexure 31: The Geo Co-ordinates of Proposed Forestry Intervention Sites in Agriculture Landscape of Ravi Riverscape in Himachal Pradesh

Sr No	Model	State	District	Division	Sitename	Area (ha.)	Lat1	Long1
1	RV/HP/AL/01 - Boundary Plantation Model	Himachal Pradesh	Chamba	Bharmour	Bharmour Division 1	10	32.43924	76.52116
2	RV/HP/AL/02 - Block Plantation Model	Himachal Pradesh	Chamba	Bharmour	Bharmour Division 1	3	32.42959	76.53461
3	RV/HP/AL/01 - Boundary Plantation Model	Himachal Pradesh	Chamba	Bharmour	Bharmour Division 2	20	32.43456	76.52365
4	RV/HP/AL/02 - Block Plantation Model	Himachal Pradesh	Chamba	Bharmour	Bharmour Division 2	2	32.42799	76.52193
5	RV/HP/AL/01 - Boundary Plantation Model	Himachal Pradesh	Chamba	Bharmour	Bharmour Division 3	15	32.43038	76.5253
6	RV/HP/AL/02 - Block Plantation Model	Himachal Pradesh	Chamba	Bharmour	Bharmour Division 3	3	32.42607	76.53415
7	RV/HP/AL/01 - Boundary Plantation Model	Himachal Pradesh	Chamba	Chamba	Chamba Division 1	10	32.54868	76.12233
8	RV/HP/AL/02 - Block Plantation Model	Himachal Pradesh	Chamba	Chamba	Chamba Division 1	2	32.54618	76.12355
9	RV/HP/AL/01 - Boundary Plantation Model	Himachal Pradesh	Chamba	Chamba	Chamba Division 2	15	32.55006	76.1191

10	RV/HP/AL/02 - Block Plantation Model	Himachal Pradesh	Chamba	Chamba	Chamba Division 2	3	32.54094	76.12451
11	RV/HP/AL/01 - Boundary Plantation Model	Himachal Pradesh	Chamba	Chamba	Chamba Division 3	10		
12	RV/HP/AL/02 - Block Plantation Model	Himachal Pradesh	Chamba	Chamba	Chamba Division 3	2	32.54179	76.11922
13	RV/HP/AL/01 – Boundary Plantation Model	Himachal Pradesh	Chamba	Churah	Churah Division 1	20	32.80589	76.12938
14	RV/HP/AL/02 - Block Plantation Model	Himachal Pradesh	Chamba	Churah	Churah Division 1	3	32.80673	76.16298
15	RV/HP/AL/01 - Boundary Plantation Model	Himachal Pradesh	Chamba	Churah	Churah Division 2	15	32.79697	76.13166
16	RV/HP/AL/02 - Block Plantation Model	Himachal Pradesh	Chamba	Churah	Churah Division 2	2	32.80169	76.14935
17	RV/HP/AL/01 - Boundary Plantation Model	Himachal Pradesh	Chamba	Churah	Churah Division 3	10	32.79687	76.11561
18	RV/HP/AL/02 - Block Plantation Model	Himachal Pradesh	Chamba	Churah	Churah Division 3	2	32.79687	76.11561
19	RV/HP/AL/01 - Boundary Plantation Model	Himachal Pradesh	Chamba	Dalhousie	Dalhousie Division 1	15	32.531	75.98021
20	RV/HP/AL/02 - Block Plantation Model	Himachal Pradesh	Chamba	Dalhousie	Dalhousie Division 1	3	32.53867	75.9806
21	RV/HP/AL/01 - Boundary Plantation Model	Himachal Pradesh	Chamba	Dalhousie	Dalhousie Division 2	20	32.53252	75.9829

22	RV/HP/AL/02 - Block Plantation Model	Himachal Pradesh	Chamba	Dalhousie	Dalhousie Division 2	2	32.53202	75.9753
23	RV/HP/AL/02 - Block Plantation Model	Himachal Pradesh	Chamba	Dalhousie	Dalhousie Division 3	2	32.53043	75.96668
24	RV/HP/AL/01 - Boundary Plantation Model	Himachal Pradesh	Chamba	Dalhousie	Dalhousie Division 3	15	32.535	75.98867

Annexure 32: The Geo Co-ordinates of Proposed Forestry Intervention Sites in Urban Landscape of Ravi Riverscape in Himachal Pradesh

Sr No.	Model	State	District	Division	Sitename	Area (ha.)	Lat1	Long1	Ele1
1	RV/HP/UL/03 - Eco-park Development	Himachal Pradesh	Chamba	Bharmour	Bharman	0.5	32.44318	76.53256	2070
2	RV/HP/UL/01 -Riverfront Development	Himachal Pradesh	Chamba	Bharmour	Bharmour	0.5	32.44318	76.53256	2070
3	RV/HP/UL/02 -Institution Plantation	Himachal Pradesh	Chamba	Bharmour	Bharmour 1	9	32.44318	76.53256	2070
4	RV/HP/UL/02 -Institution Plantation	Himachal Pradesh	Chamba	Bharmour	Bharmour 2	6	32.44318	76.53256	2070
5	RV/HP/UL/02 -Institution Plantation	Himachal Pradesh	Chamba	Bharmour	Bharmour 3	5	32.44318	76.53256	2070
6	RV/HP/UL/03 - Eco-park Development	Himachal Pradesh	Chamba	Bharmour	Sachuin Site	1	32.44318	76.53256	2070
7	RV/HP/UL/02 -Institution Plantation	Himachal Pradesh	Chamba	Chamba	Chamba 1	10	32.55383	76.12735	959
8	RV/HP/UL/01 -Riverfront Development	Himachal Pradesh	Chamba	Chamba	Chamba 1	0.5	32.55383	76.12735	959

9	RV/HP/UL/03 - Eco-park Development	Himachal Pradesh	Chamba	Chamba	Chamba 1	0.5	32.55383	76.12735	959
10	RV/HP/UL/02 -Institution Plantation	Himachal Pradesh	Chamba	Chamba	Chamba 2	15	32.55383	76.12735	959
11	RV/HP/UL/01 -Riverfront Development	Himachal Pradesh	Chamba	Chamba	Chamba 2	0.5	32.55383	76.12735	959
12	RV/HP/UL/03 - Eco-park Development	Himachal Pradesh	Chamba	Chamba	Chamba 2	0.4	32.55383	76.12735	959
13	RV/HP/UL/02 -Institution Plantation	Himachal Pradesh	Chamba	Chamba	Chamba 3	10	32.55383	76.12735	959
14	RV/HP/UL/03 - Eco- park Development	Himachal Pradesh	Chamba	Chamba	Kurdaho Di Mata Temple	0.2	32.55383	76.12735	959
15	RV/HP/UL/03 - Eco-park Development	Himachal Pradesh	Chamba	Chamba	Kurdahodi Mata Temple	0.5	32.49944	76.10889	
16	RV/HP/UL/03 - Eco-park Development	Himachal Pradesh	Chamba	Chamba	Kyani/Chyani	1	32.55383	76.12735	959
17	RV/HP/UL/03 - Eco- park Development	Himachal Pradesh	Chamba	Chamba	Mohri Nala, Prahnvi Panchayat	1	32.55383	76.12735	959
18	RV/HP/UL/02 -Institution Plantation	Himachal Pradesh	Chamba	Churah	Churah 1	8	32.72305	76.04466	1757
19	RV/HP/UL/02 -Institution Plantation	Himachal Pradesh	Chamba	Churah	Churah 2	10	32.72305	76.04466	1757
20	RV/HP/UL/02 -Institution Plantation	Himachal Pradesh	Chamba	Churah	Churah 3	7	32.72305	76.04466	1757
21	RV/HP/UL/03 - Eco-park Development	Himachal Pradesh	Chamba	Churah	Swai	0.4	32.83502	76.15718	1563
22	RV/HP/UL/03 - Eco-park	Himachal	Chamba	Churah	Tissa	0.5	32.8284	76.1509	1374

	Development	Pradesh							
23	RV/HP/UL/02 -Institution Plantation	Himachal Pradesh	Chamba	Dalhousie	Dalhousie 1	8	32.53993	75.9703	1923
24	RV/HP/UL/02 -Institution Plantation	Himachal Pradesh	Chamba	Dalhousie	Dalhousie 2	8	32.53993	75.9703	1923
25	RV/HP/UL/02 -Institution Plantation	Himachal Pradesh	Chamba	Dalhousie	Dalhousie 3	8	32.53993	75.9703	1923
26	RV/HP/UL/01 -Riverfront Development	Himachal Pradesh	Chamba	Dalhousie	Goli	0.5	32.57948	75.9894	1112
27	RV/HP/UL/03 - Eco-park Development	Himachal Pradesh	Chamba	Dalhousie	Nature park at Banikhet	0.5	32.54587	75.94932	1627
28	RV/HP/UL/03 - Eco-park Development	Himachal Pradesh	Chamba	Dalhousie	Udaipur	0.7	32.53993	75.9703	1923

Annexure 33: The Geo Co-ordinates of Proposed Forestry Intervention Sites in Other intervention of Ravi Riverscape in Himachal Pradesh

Sr No	State	District	Division	Sitename	Area (ha.)	Lat1	Long1	Ele1
1	Himachal Pradesh	Chamba	Chamba Wildlife Division	Gamgul siahbehi	15	32.847	76.068	2039
2	Himachal Pradesh	Chamba	Chamba Wildlife Division	Kalatop Wildlife Sanctuary	5	32.55299	76.01764	2295
3	Himachal Pradesh	Chamba	Chamba Wildlife Division	khajjiar wildlife sanctuary	15	32.54629	76.06005	1970
4	Himachal Pradesh	Chamba	Chamba Wildlife Division	Kugti Wildlife Sanctuary	30	32.44963	76.61452	2146

5	Himachal Pradesh	Chamba	Chamba Wildlife Division	Manimahesh wetland	12	32.39467	76.63737	4184
6	Himachal Pradesh	Chamba	Chamba Wildlife Division	Tundah Wildlife Sanctuary	15	32.40479	76.26993	3420
7	Himachal Pradesh	Hamirpur	Hamirpur WL	Dhauladhar WLS	55	32.48562	76.09736	2618

Annexure 34: The Geo Co-ordinates of Proposed Forestry Intervention Sites in Agriculture Landscape of Ravi Riverscape in Jammu & Kashmir UT

Sr No	Model	State	District	Division	Sitename	Area (ha.)	Lat.	Long.
1	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Udhampur	Ramnagar	Ramnagar Division 1	20	32.756	75.41882
2	RV/JK/AL/02 –Block Plantation Model	Jammu & Kashmir	Udhampur	Ramnagar	Ramnagar Division 1	3	32.73244	75.39218
3	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Udhampur	Ramnagar	Ramnagar Division 2	10	32.76047	75.42313
4	RV/JK/AL/02 -Block Plantation Model	Jammu & Kashmir	Udhampur	Ramnagar	Ramnagar Division 2	2	32.72158	75.38521
5	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Udhampur	Ramnagar	Ramnagar Division 3	15	32.75069	75.40769
6	RV/JK/AL/02 -Block Plantation Model	Jammu & Kashmir	Udhampur	Ramnagar	Ramnagar Division 3	2	32.72158	75.38521
7	RV/JK/AL/02 -Block Plantation Model	Jammu & Kashmir	Kathua	Basohli	Basohli Division 3	3	32.49811	75.81094

8	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Kathua	Basohli	Basohli Division 1	10	32.49961	75.80855
9	RV/JK/AL/02 -Block Plantation Model	Jammu & Kashmir	Kathua	Basohli	Basohli Division 1	2	32.49873	75.80715
10	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Kathua	Basohli	Basohli Division 2	20	32.49937	75.81106
11	RV/JK/AL/02 -Block Plantation Model	Jammu & Kashmir	Kathua	Basohli	Basohli Division 2	3		
12	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Kathua	Basohli	Basohli Division 3	15	32.50012	75.80455
13	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Kathua	Billawar	Billawar Division 1	15	32.6118	75.59839
14	RV/JK/AL/02 -Block Plantation Model	Jammu & Kashmir	Kathua	Billawar	Billawar Division 1	3	32.61642	75.5942
15	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Kathua	Billawar	Billawar Division 2	10	32.61335	75.59748
16	RV/JK/AL/02 -Block Plantation Model	Jammu & Kashmir	Kathua	Billawar	Billawar Division 2	2	32.60787	75.59349
17	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Kathua	Billawar	Billawar Division 3	15	32.61065	75.59777
18	RV/JK/AL/02 -Block Plantation Model	Jammu & Kashmir	Kathua	Billawar	Billawar Division 3	3	32.6048	75.59338
19	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Kathua	Kathua	Kathua Division 1	12	32.38432	75.52857
20	RV/JK/AL/02 -Block Plantation Model	Jammu & Kashmir	Kathua	Kathua	Kathua Division 1	2	32.37905	75.50107
21	RV/JK/AL/02 -Block Plantation	Jammu & Kashmir	Kathua	Kathua	Kathua Division 2	3	32.38785	75.50173

	Model							
22	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Kathua	Basohli	Basohli Division 3	15	32.50012	75.80455
23	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Kathua	Billawar	Billawar Division 1	15	32.6118	75.59839
24	RV/JK/AL/02 -Block Plantation Model	Jammu & Kashmir	Kathua	Billawar	Billawar Division 1	3	32.61642	75.5942
25	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Kathua	Billawar	Billawar Division 2	10	32.61335	75.59748
26	RV/JK/AL/02 -Block Plantation Model	Jammu & Kashmir	Samba	Samba	Samba Division 1	3	32.53396	75.14334
27	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Samba	Samba	Samba Division 2	10	32.54973	75.14537
28	RV/JK/AL/02 -Block Plantation Model	Jammu & Kashmir	Samba	Samba	Samba Division 2	2	32.52312	75.09988
29	RV/JK/AL/01 -Boundary Plantation Model	Jammu & Kashmir	Samba	Samba	Samba Division 3	15	32.5362	75.11316
30	RV/JK/AL/02 -Block Plantation Model	Jammu & Kashmir	Samba	Samba	Samba Division 3	2	32.53432	75.12963

Annexure 35: The Geo Co-ordinates of Proposed Forestry Intervention Sites in Urban Landscape of Ravi Riverscape in Jammu & Kashmir UT

Sr No	Model	State	District	Division	Sitename	Area (ha.)	Lat1	Long1	Ele1
1	RV/JK/UL/02 -Institution Plantation	Jammu & Kashmir	Udhampur	Ramnagar	Ramnagar 1	6	32.8053	75.31714	848
2	RV/JK/UL/02 -Institution Plantation	Jammu & Kashmir	Udhampur	Ramnagar	Ramnagar 2	9	32.8053	75.31714	848
3	RV/JK/UL/02 -Institution Plantation	Jammu & Kashmir	Udhampur	Ramnagar	Ramnagar 3	10	32.8053	75.31714	848
4	RV/JK/UL/03 -Ecopark Development	Jammu & Kashmir	Kathua	Basohli	Basohli	1	32.49584	75.81432	543
5	RV/JK/UL/03 –Ecopark Development	Jammu & Kashmir	Kathua	Basohli	Basohli	0.5	32.50384	75.80963	731
6	RV/JK/UL/02 –Institution Plantation	Jammu & Kashmir	Kathua	Basohli	Basohli 1	5	32.50384	75.80963	731
7	RV/JK/UL/02 -Institution Plantation	Jammu & Kashmir	Kathua	Basohli	Basohli 2	8	32.50384	75.80963	731
8	RV/JK/UL/02 –Institution Plantation	Jammu & Kashmir	Kathua	Basohli	Basohli 3	8	32.50384	75.80963	731
9	RV/JK/UL/02 -Institution Plantation	Jammu & Kashmir	Kathua	Billawar	Billawar 1	6	32.61347	75.604	855
10	RV/JK/UL/03 -Ecopark Development	Jammu & Kashmir	Kathua	Billawar	Billawar 1	0.5	32.61347	75.604	855
11	RV/JK/UL/02 -Institution Plantation	Jammu & Kashmir	Kathua	Billawar	Billawar 2	6	32.61347	75.604	855
12	RV/JK/UL/03 Ecopark	Jammu & Kashmir	Kathua	Billawar	Billawar 2	0.4	32.61347	75.604	855

	Development								
13	RV/JK/UL/02 –Institution Plantation	Kashmir	Kathua	Billawar	Billawar 3	8	32.61347	75.604	855
14	RV/JK/UL/03 -Ecopark Development	Jammu & Kashmir	Kathua	Billawar	Hanuman Mandir	1	32.61349	75.60204	713
15	RV/JK/UL/03 –Ecopark Development	Jammu & Kashmir	Kathua	Billawar	Hanuman Site Billawar	0.8	32.61332	75.60138	
16	RV/JK/UL/02 -Institution Plantation	Jammu & Kashmir	Kathua	Billawar	Hanuman Site Billawar	0.49	32.61332	75.60138	
17	RV/JK/UL/02 -Institution Plantation	Jammu & Kashmir	Kathua	Kathua	Kathua 1	8	32.38488	75.52789	337
18	RV/JK/UL/02 -Institution Plantation	Jammu & Kashmir	Kathua	Kathua	Kathua 2	8	32.38488	75.52789	337
19	RV/JK/UL/02 -Institution Plantation	Jammu & Kashmir	Kathua	Kathua	Kathua 3	9	32.38488	75.52789	337
20	RV/JK/UL/02 -Institution Plantation	Jammu & Kashmir	Samba	Samba	Samba 1	8	32.55313	75.11085	364
21	RV/JK/UL/03 -Ecopark Development	Jammu & Kashmir	Samba	Samba	Samba 1	0.5	32.55313	75.11085	364
22	RV/JK/UL/02 -Institution Plantation	Jammu & Kashmir	Samba	Samba	Samba 2	11	32.55313	75.11085	364
23	RV/JK/UL/03 –Ecopark Development	Jammu & Kashmir	Samba	Samba	Samba 2	0.4	32.55313	75.11085	364
24	RV/JK/UL/02 -Institution Plantation	Jammu & Kashmir	Samba	Samba	Samba 3	11	32.55313	75.11085	364

Annexure 36 : The Geo Co-ordinates of Proposed Forestry Intervention Sites in Other Intervention of Ravi Riverscape in Jammu & Kashmir UT

Sr No.	State	District	Division	Sitename	Area (ha.)	Lat1	Long1	Ele1
1	Jammu & Kashmir	Kathua	Kathua WL	Jasrota Wildlife Sanctuary	9	32.45935	75.42615	564

Annexure 37: The Geo Co-ordinates of Proposed Forestry Intervention Sites in Agriculture Landscape of Ravi Riverscape in Punjab

Sr No	Model	State	District	Division	Sitename	Area (ha.)	Lat1	Long1
1	RV/PB/AL/01 –Boundary Plantation Model	Punjab	Amritsar	Amritsar	Amritsar Division 1	100	31.90666	74.77523
2	RV/PB/AL/02 -Block Plantation Model	Punjab	Amritsar	Amritsar	Amritsar Division 1	15	31.90666	74.77523
3	RV/PB/AL/01 -Boundary Plantation Model	Punjab	Amritsar	Amritsar	Amritsar Division 2	50	31.8892	74.72811
4	RV/PB/AL/02 -Block Plantation Model	Punjab	Amritsar	Amritsar	Amritsar Division 2	10	31.8892	74.72811
5	RV/PB/AL/01 –Boundary Plantation Model	Punjab	Amritsar	Amritsar	Amritsar Division 3	70	31.86532	74.66592
6	RV/PB/AL/02 -Block Plantation Model	Punjab	Amritsar	Amritsar	Amritsar Division 3	12	31.86532	74.66592

7	RV/PB/AL/01 -Boundary Plantation Model	Punjab	Gurdaspur	Gurdaspur	Gurdaspur Division 1	80	32.10391	75.30862
8	RV/PB/AL/02 -Block Plantation Model	Punjab	Gurdaspur	Gurdaspur	Gurdaspur Division 1	14	32.10391	75.30862
9	RV/PB/AL/01 –Boundary Plantation Model	Punjab	Gurdaspur	Gurdaspur	Gurdaspur Division 2	90		
10	RV/PB/AL/02 -Block Plantation Model	Punjab	Gurdaspur	Gurdaspur	Gurdaspur Division 2	15	32.10391	75.30862
11	RV/PB/AL/01 –Boundary Plantation Model	Punjab	Gurdaspur	Gurdaspur	Gurdaspur Division 3	70	32.10391	75.30862
12	RV/PB/AL/02 -Block Plantation Model	Punjab	Gurdaspur	Gurdaspur	Gurdaspur Division 3	10	32.10391	75.30862
13	RV/PB/AL/01 -Boundary Plantation Model	Punjab	Pathankot	Pathankot	Pathankot Division 1	60	32.2838	75.64635
14	RV/PB/AL/02 -Block Plantation Model	Punjab	Pathankot	Pathankot	Pathankot Division 1	14	32.28538	75.64438
15	RV/PB/AL/01 -Boundary Plantation Model	Punjab	Pathankot	Pathankot	Pathankot Division 2	100	32.27699	75.66818
16	RV/PB/AL/02 -Block Plantation Model	Punjab	Pathankot	Pathankot	Pathankot Division 2	13	32.28305	75.67189
17	RV/PB/AL/01 -Boundary Plantation Model	Punjab	Pathankot	Pathankot	Pathankot Division 3	80	32.27338	75.66602
18	RV/PB/AL/02 -Block Plantation Model	Punjab	Pathankot	Pathankot	Pathankot Division 3	15	32.28592	75.63829

Annexure 38: The Geo Co-ordinates of Proposed Forestry Intervention Sites in Urban Landscape of Ravi Riverscape in Punjab

Sr. No	Model	State	District	Division	Sitename	Area (ha.)	Lat1	Long1	Ele1
1	RV/PB/UL/02 – Riverfront Development	Punjab	Amritsar	Amritsar	Amritsar	1	31.63487	74.87214	231
2	RV/PB/UL/03 – Institution Plantation	Punjab	Amritsar	Amritsar	Amritsar 1	10	31.63487	74.87214	231
3	RV/PB/UL/01 -Bioremediation and Bio-filtration	Punjab	Amritsar	Amritsar	Amritsar 1	1	31.63487	74.87214	231
4	RV/PB/UL/04 - Eco-park Development	Punjab	Amritsar	Amritsar	Amritsar 1	1	31.63487	74.87214	231
5	RV/PB/UL/03 – Institution Plantation	Punjab	Amritsar	Amritsar	Amritsar 2	8	31.63487	74.87214	231
6	RV/PB/UL/01 -Bioremediation and Bio- filtration	Punjab	Amritsar	Amritsar	Amritsar 2	0.5	31.63487	74.87214	231
7	RV/PB/UL/04 - Eco-park Development	Punjab	Amritsar	Amritsar	Amritsar 2	0.3	31.63487	74.87214	231
8	RV/PB/UL/03 – Institution Plantation	Punjab	Amritsar	Amritsar	Amritsar 3	7	31.63487	74.87214	231
9	RV/PB/UL/01 -Bioremediation and Bio- filtration	Punjab	Amritsar	Amritsar	Amritsar 3	0.6	31.63487	74.87214	231
10	RV/PB/UL/04 - Eco-park Development	Punjab	Amritsar	Amritsar	Amritsar 3	0.5	31.63487	74.87214	231
11	RV/PB/UL/01 - Bioremediation and Bio-filtration	Punjab	Amritsar	Amritsar	Amritsar 4	1	31.63487	74.87214	231

12	RV/PB/UL/04 - Eco-park Development	Punjab	Amritsar	Amritsar	Amritsar 4	0.5	31.63487	74.87214	231
13	RV/PB/UL/02 – Riverfront Development	Punjab	Gurdaspur	Gurdaspur	Gurdaspur	0.7	32.04042	75.39752	264
14	RV/PB/UL/03 – Institution Plantation	Punjab	Gurdaspur	Gurdaspur	Gurdaspur 1	12	32.04042	75.39752	264
15	RV/PB/UL/01 -Bioremediation and Bio- filtration	Punjab	Gurdaspur	Gurdaspur	Gurdaspur 1	1	32.04042	75.39752	264
16	RV/PB/UL/03 – Institution Plantation	Punjab	Gurdaspur	Gurdaspur	Gurdaspur 2	10	32.04042	75.39752	264
17	RV/PB/UL/01 -Bioremediation and Bio-filtration	Punjab	Gurdaspur	Gurdaspur	Gurdaspur 2	0.6	32.04042	75.39752	264
18	RV/PB/UL/03 – Institution Plantation	Punjab	Gurdaspur	Gurdaspur	Gurdaspur 3	8	32.04042	75.39752	264
19	RV/PB/UL/01 -Bioremediation and Bio- filtration	Punjab	Gurdaspur	Gurdaspur	Gurdaspur 3	0.5	32.04042	75.39752	264
20	RV/PB/UL/01 -Bioremediation and Bio- filtration	Punjab	Gurdaspur	Gurdaspur	Gurdaspur 4	0.5	32.04042	75.39752	264
21	RV/PB/UL/01 -Bioremediation and Bio- filtration	Punjab	Gurdaspur	Gurdaspur	Gurdaspur 5	0.4	32.04042	75.39752	264
22	RV/PB/UL/04 - Eco-park Development	Punjab	Gurdaspur	Gurdaspur	Khokhar 197	0.2	32.53	75.296	
23	RV/PB/UL/04 - Eco-park Development	Punjab	Gurdaspur	Gurdaspur	Shahpur goraya 1	0.4	32.03169	75.09643	241
24	RV/PB/UL/04 - Eco-park Development	Punjab	Gurdaspur	Gurdaspur	Truwali	0.3	32.9716	75.03563	239
25	RV/PB/UL/04 - Eco-park development	Punjab	Pathankot	Pathankot	Chamror	1	32.27302	75.65286	336

26	RV/PB/UL/02 – Riverfront Development	Punjab	Pathankot	Pathankot	Pathankot	1	32.27302	75.65286	336
27	RV/PB/UL/03 – Institution Plantation	Punjab	Pathankot	Pathankot	Pathankot 1	13	32.27302	75.65286	336
28	RV/PB/UL/01 -Bioremediation and Bio- filtration	Punjab	Pathankot	Pathankot	Pathankot 1	1	32.27302	75.65286	336
29	RV/PB/UL/04 - Eco-park Development	Punjab	Pathankot	Pathankot	Pathankot 1	0.4	32.27302	75.65286	336
30	RV/PB/UL/03 - Institution Plantation	Punjab	Pathankot	Pathankot	Pathankot 2	11	32.27302	75.65286	336
31	RV/PB/UL/01 -Bioremediation and Bio- filtration	Punjab	Pathankot	Pathankot	Pathankot 2	2	32.27302	75.65286	336
32	RV/PB/UL/03 – Institution Plantation	Punjab	Pathankot	Pathankot	Pathankot 3	9	32.27302	75.65286	336

Annexure 39: The Geo Co-ordinates of Proposed Forestry Intervention Sites in Other Intervention of Ravi Riverscape, in Punjab

Sr No	State	District	Division	Sitename	Area (ha.)	Lat1	Long1	Ele1
1	Punjab	Amritsar	Amritsar	Jastarwal jheel	3	31.81399	74.70399	223
2	Punjab	Gurdaspur	Pathankot WL	Kathlaur kushlian WL Sanctuary	8	32.24267	75.44151	267
3	Punjab	Pathankot	Pathankot WL	Ranjit Sagar Dam	25	32.44583	75.73959	567
4	Punjab	Pathankot	Pathankot WL	Ranjit sagar dam Conservation Reserve	8	32.45175	75.72452	550

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Annexure 40- Consent letter regarding availability of land for forestry Intervention in Ravi Riverscape in Punjab

Government of Punjab
Department of Forest & Wildlife Preservation
O/o Principal Chief Conservator of Forests (HoFF),
Forest Complex, Sector 68, SAS Nagar (Mohali)

To

Director General,
Indian Council of Forestry Research &Education,
P.O. New Forest,
Dehradun.

No.
Dated:

Subject: **Feedback and comments on availability of land for forestry Interventions proposed in the DPR for Rejuvenation of Rivers.**

Reference: Your letter No. 41-58/2019/ADG (M&E) /ICFRE/DPR/ VOl.II/ 113 dated 12/10/2020 and NAEB letter No.12-4/2017 B-III (NAEB) dated 17/09/2020

With reference to above mentioned letters concerning the availability of land to carry out the prescribed forestry interventions, it is intimated that the required information has been provided by the respective divisions of the Punjab Forest Department with regard to the locations along the river scapes of Beas, Ravi and Satluj and its tributaries. The proposed forestry interventions have been deliberated in the stake holders meeting.

In view of above, it is intimated that the sufficient land is available to take up the forestry interventions along the river scapes of Beas, Ravi and Satluj in respective forest divisions of Punjab State.

Principal Chief Conservator of Forest (HoFF)
Punjab, SAS Nagar, Mohali.

No. SP2/1730-31 Dated :- 27/10/2020

Copy is forwarded to the following for information and necessary action.

1. Assistant Commissioner (Forest), Ministry of Environment Forest & Climate Change (NAEB), New Delhi.
2. Director, HFRI, Shimla, Himachal Pradesh.

Principal Chief Conservator of Forest (HoFF)
Punjab, SAS Nagar, Mohali.

Annexure: 41- Consent letter regarding availability of land for forestry Intervention in Ravi Riverscape in Himachal Pradesh

Office of
Principal Chief Conservator of Forests
(Head of Forest Force)
Himachal Pradesh Forest Department Headquarters, Talland, Shimla-171 001

स्वच्छ भारत
एक कदम स्वच्छता की ओर

No. Ft.15-642/2019(D)DPR/IRB
Himachal Pradesh Forest Department

To

The Director,
Himalayan Forestry Research Institute,
Conifer Campus, Panthaghati, Shimla-1710013.

Dated Shimla-1, the - 3 NOV 2020

Subject Request to provide information on availability of land for forestry interventions and certificate of verification of plantation and cost.

Sir,

Kindly refer to your office letter No.4 (Vistar-28) Hi.v.a.s./2020/ 1288 dated 25.09.2020 on the subject cited above.

2. In this regard it is certified that land is available in the concerned Forest Divisions for proposed forestry inventions as mentioned in the Draft Detailed Project Reports (DPRs) for rejuvenation of five major rivers i.e. Beas, Chenab, Jhelum, Ravi & Satluj prepared/finalized by the Himalayan Forest Research Institute, Shimla in consultation with the field officers of this department as per geo-coordinates given in the DPRs.

Yours faithfully,

Chief Conservator of Forests (Fin.)
Himachal Pradesh.

3.11.2020

Annexure: 42- Consent letter regarding availability of land for forestry Intervention in Ravi Riverscape in Jammu and Kashmir UT

Office Address
May to October: Forest Complex, Shiekh Bagh, Lal Chowk, Srg-190001 | Phone: 0194-2483610, Fax: 0194-2455827
Nov. to April: Van Bhawan, Below Gamat, Jammu-180001 | Phone: 0191-2566585, Fax: 0191-2547270
URL Address: www.jkforest.gov.in
E-mail: pccfjkforest@gmail.com

Government of Jammu & Kashmir
Office of the Pr. Chief Conservator of Forests & HoFF
Jammu & Kashmir Forest Department

Director General of Forest
& Special Secretary, Government of India,
MoEFCC, New Delhi.

No: PCCF/Plg/208/1405-07 **Dated:** 26 **-11-2020**

Reference No.: D.O. No. 12-4/2017-B-III (P) dated 17.11.2020

Subject: DPR on Forestry Interventions for Chenab, Jhelum & Ravi for Jammu & Kashmir.

Sir,

The J&K Forest Department is providing all necessary assistance to Himalayan Forest Research Institute for the preparation of DPR on Forestry Interventions for rejuvenation of Jhelum, Chenab & Ravi rivers in Jammu & Kashmir. The Director, Himalayan Forest Research Institute has shared certain information and has sought inputs with regard to the availability of land in various forest divisions in the riverscapes of aforementioned rivers for the proposed forestry interventions. After getting the inputs from the concerned DFOs, the necessary information have also been sent to DG ICFRE vide this office No. PCCF/Plg/Himalaya/208/1320-23 dated 12.11.2020.

It is once again reiterated that J&K Forest Department will continue to provide the necessary assistance for implementation of the projects as per the approved DPRs.

Yours faithfully,

(Dr. Mohit Gera) IFS
Pr. Chief Conservator of Forests (HoFF), J&K

Copy for information to:
1) DG ICFRE, P.O. New Forest, Dehradun-248006
2) Director HFRI, Panthaghati, Shimla.